

# **COTTONWOOD HEIGHTS**

## **CITY WIDE ROADWAY IMPROVEMENT PROJECT PROJECT 004.21**

### **BIDDING DOCUMENTS**

May 25<sup>th</sup> 2021

**ADDENDUM NO. 1**

TO: CONTRACT DOCUMENTS  
FOR: 2021 CITY WIDE ROADWAY IMPROVEMENT PROJECT - #004.21  
FOR: COTTONWOOD HEIGHTS

- A. Section 00 0 30
  - a. Revise due date for BIDDING DOCUMENTS
    - i. Separate sealed bids will be received by the OWNER in their office located at 2277 East Bengal Boulevard, Cottonwood Heights, Utah 84121 until **2:00 p.m. on JUNE 17<sup>th</sup>, 2021** and then at said office publicly opened and read aloud. Bids shall be addressed and delivered to Cottonwood Heights Recorder, prior to the Bid Opening.
  - b. Revise date plans will be made available.
    - i. CONTRACT DOCUMENTS may be examined beginning on June 1st at 11:00 AM at the City Offices, 2277 E. Bengal Blvd., Cottonwood Heights; request for a copy of CONTRACT DOCUMENTS shall be submitted via email to Adam Ginsberg at [aginsberg@ch.utah.gov](mailto:aginsberg@ch.utah.gov)

**COTTONWOOD HEIGHTS**

**DOCUMENT 00 00 30**

**INVITATION TO BID**

CITY OF COTTONWOOD HEIGHTS  
2277 East Bengal Boulevard  
Cottonwood Heights, Utah 84121

Notice is hereby given that the CITY OF COTTONWOOD HEIGHTS (OWNER) will accept bids for the construction of the CITY-WIDE ROADWAY IMPROVEMENT PROJECT - PROJECT # 004.21 - according to Drawings and Specifications prepared by the ENGINEER, and described in general as:

The work includes furnishing all labor, tools, materials, equipment, transportation, and services required for the construction of the below described project, located in Cottonwood Heights.

Work for roadway improvement project (Project # 004.21) consists of the following items of work: mobilization, traffic control, and maintenance of traffic; reconstruction of miscellaneous structures to grade; all required earthwork; reconstruction of curb and gutter, sidewalks, driveway approaches, ADA access ramps; rotomilling and/or asphalt removal of existing pavement; placing and compacting new asphalt surface course; placing of tack coat and pavement reinforcement fabric; traffic paint striping, messages; and all appurtenant work; all in accordance with Drawings and Specifications prepared by the Engineer.

CONTRACT DOCUMENTS may be examined beginning on May 25th at 11:00 AM at the City Offices, 2277 E. Bengal Blvd., Cottonwood Heights; request for a copy of CONTRACT DOCUMENTS shall be submitted via email to Adam Ginsberg at [aginsberg@ch.utah.gov](mailto:aginsberg@ch.utah.gov)

Separate sealed bids will be received by the OWNER in their office located at 2277 East Bengal Boulevard, Cottonwood Heights, Utah 84121 until 2:00 p.m. on June 8th, 2021 and then at said office publicly opened and read aloud. Bids shall be addressed and delivered to Cottonwood Heights Recorder, prior to the Bid Opening.

Bid security in the amount of 5% of the base bid will be required to accompany bids.

All questions relative to the project shall be submitted via email to Adam Ginsberg at [aginsberg@ch.utah.gov](mailto:aginsberg@ch.utah.gov)

The OWNER reserves the right to reject any or all bids; or to accept or reject the whole or any part of any bid; or to waive any informality or technicality in any bid in the best interest of the City. Only bids giving a firm quotation properly signed will be accepted.

- END OF DOCUMENT -

## **Instructions to Bidders**

### **TABLE OF ARTICLES**

#### **ARTICLE 1 - DEFINED TERMS**

1.01 Terms used in these Instructions to Bidders will have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:

- A. Issuing Office--The office from which the Bidding Documents are to be issued and where the bidding procedures are to be administered.

#### **ARTICLE 2 - COPIES OF BIDDING DOCUMENTS**

2.01 Complete sets of the Bidding Documents may be obtained by emailing aginsberg@ch.utah.gov.

2.02 Complete sets of Bidding Documents must be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

2.03 Owner and Engineer in making copies of Bidding Documents available on the above terms do so only for the purpose of obtaining Bids for the Work and do not confer a license or grant for any other use.

#### **ARTICLE 3 - QUALIFICATIONS OF BIDDERS**

3.01 ~~To be qualified to bid the Work, Bidders must have been previously pre-qualified for this project by Owner.~~

#### **ARTICLE 4 - EXAMINATION OF BIDDING DOCUMENTS, OTHER RELATED DATA, AND SITE**

4.01 Subsurface and Physical Conditions

- A. The Supplementary Conditions identify:

1. Those reports of explorations and tests of subsurface conditions at or contiguous to the Site that Engineer has used in preparing the Bidding Documents.
2. Those drawings of physical conditions in or relating to existing surface and subsurface structures at or contiguous to the Site (except Underground Facilities) that Engineer has used in preparing the Bidding Documents.

- B. Copies of reports and drawings referenced in paragraph 4.01.A will be made available by Owner to any Bidder on request. Those reports and drawings are not part of the



Contract Documents, but the “technical data” contained therein upon which Bidder is entitled to rely as provided in paragraph 4.02 of the General Conditions has been identified and established in paragraph 4.02 of the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any “technical data” or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.

#### 4.02 Underground Facilities

- A. Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site is based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities, including Owner, or others.

#### 4.03 Hazardous Environmental Condition

- A. The Supplementary Conditions identify those reports and drawings relating to a Hazardous Environmental Condition identified at the Site, if any, that ENGINEER has used in preparing the Bidding Documents.
- B. Copies of reports and drawings referenced in paragraph 4.03.A will be made available by Owner to any Bidder on request. Those reports and drawings are not part of the Contract Documents, but the “technical data” contained therein upon which Bidder is entitled to rely as provided in paragraph 4.06 of the General Conditions has been identified and established in paragraph 4.06 of the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any “technical data” or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.

4.04 Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated conditions appear in paragraphs 4.02, 4.03, and 4.04 of the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work appear in paragraph 4.06 of the General Conditions.

4.05 On request, Owner will provide Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies as Bidder deems necessary for submission of a Bid. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies. Bidder shall comply with all applicable Laws and Regulations relative to locating of excavation and utility.

4.06 Additional Owner Provided Information:

- A. Reference is made to Article 7 of the Supplementary Conditions for the identification of the general nature of other work that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) that relates to the Work contemplated by these Bidding Documents. On request, Owner will provide to each Bidder for examination access to or copies of Contract Documents (other than portions thereof related to price) for such other work.
- B. Paragraph 6.13.C of the General Conditions states that if an Owner safety program exists it will be noted in the Supplementary Conditions.

4.07 It is the responsibility of each Bidder before submitting a Bid to:

- A. Examine and carefully study the Bidding Documents, the other related data identified in the Bidding Documents, and any Addenda;
- B. Visit the Site and become familiar with and satisfy Bidder as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;
- C. Become familiar with and satisfy Bidder as to all Federal, State, and local Laws and Regulations that may affect cost, progress, or performance of the Work;
- D. Carefully study all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) which have been identified in the Supplementary Conditions as provided in paragraph 4.02 of the General Conditions, and (2) reports and drawings of Hazardous Environmental Conditions at the Site which have been identified in the Supplementary Conditions as provided in paragraph 4.06 of the General Conditions;
- E. Obtain and carefully study (or accept consequences for not doing so) all additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents, and safety precautions and programs incident thereto;
- F. Agree at the time of submitting its Bid that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price(s) bid and within the times and in accordance with the other terms and conditions of the Bidding Documents;

- G. Become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;
  - H. Correlate the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents;
  - I. Promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder; and
  - J. Determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work.
- 4.08 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 4, that without exception the Bid is premised upon performing and furnishing the Work required by the Bidding Documents and applying any specific means, methods, techniques, sequences, and procedures of construction that may be shown or indicated or expressly required by the Bidding Documents, that Bidder has given Engineer written notice of all conflicts, errors, ambiguities, and discrepancies that Bidder has discovered in Bidding Documents and the written resolutions thereof by Engineer are acceptable to Bidder, and that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work.

## **ARTICLE 5 - PRE-BID CONFERENCE**

5.01 None

## **ARTICLE 6 - SITE AND OTHER AREAS**

6.01 The Site is identified in the Bidding Documents. Easements for permanent structures or permanent changes in existing facilities are to be obtained and paid for by Owner unless otherwise provided in the Bidding Documents. All additional lands and access thereto required for temporary construction facilities, construction equipment, or storage of materials and equipment to be incorporated in the Work are to be obtained and paid for by Contractor.

## **ARTICLE 7 - INTERPRETATIONS AND ADDENDA**

7.01 All questions about the meaning or intent of the Bidding Documents are to be submitted to Engineer in writing. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by Engineer as having received the Bidding Documents. Questions received less than three days prior to the date for opening of Bids may not be answered. Only

questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

7.02 Addenda may be issued to clarify, correct, or change the Bidding Documents as deemed advisable by Owner or Engineer.

## **ARTICLE 8 - BID SECURITY**

8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of 5% of Bidder's maximum Bid price and in the form of a certified check or a Bid bond (EJCDC No. C-430, 2013 Edition) issued by a surety meeting the requirements of paragraphs 5.01 and 5.02 of the General Conditions.

8.02 The Bid security of the Successful Bidder will be retained until such Bidder has executed the Contract Documents, furnished the required contract security and met the other conditions of the Notice of Award, whereupon the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within 15 days after the Notice of Award, Owner may annul the Notice of Award and the Bid security of that Bidder will be forfeited. The Bid security of other Bidders whom Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of seven days after the Effective Date of the Agreement or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be returned.

8.03 Bid security of other Bidders whom OWNER believes do not have a reasonable chance of receiving the award will be returned within seven days after the Bid opening.

## **ARTICLE 9 - CONTRACT TIMES**

9.01 The number of days within which, or the dates by which, the Work is to be substantially completed and ready for final payment are set forth in the Agreement.

9.02 The PROJECT START TIME is after May 1<sup>st</sup>, 2021

## **ARTICLE 10 - LIQUIDATED DAMAGES**

10.01 Provisions for liquidated damages are set forth in the Agreement.

## **ARTICLE 11 - SUBSTITUTE AND "OR-EQUAL" ITEMS**

11.01 The Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration of possible substitute or "or-equal" items. Whenever it is specified or described in the Bidding Documents that a substitute or "or-equal" item of material or equipment may be furnished or used by CONTRACTOR if acceptable to ENGINEER, application for such acceptance will not be considered by ENGINEER until after the Effective Date of the Agreement. The procedure for submission of any such application by CONTRACTOR and consideration by EN

GINEER is set forth in the General Conditions and may be supplemented in the General Requirements.

## **ARTICLE 12 - SUBCONTRACTORS, SUPPLIERS, AND OTHERS**

- 12.01 If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, individuals, or entities to be submitted to Owner in advance of a specified date prior to the Effective Date of the Agreement, the apparent Successful Bidder, and any other Bidder so requested, shall within five days after Bid opening, submit to Owner a list of all such Subcontractors, Suppliers, individuals, or entities proposed for those portions of the Work for which such identification is required. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, individual, or entity if requested by Owner. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit a substitute, without an increase in the Bid.
- 12.02 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest responsible Bidder that proposes to use acceptable Subcontractors, Suppliers, individuals, or entities. Declining to make requested substitutions will not constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which Owner and Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to revocation of such acceptance after the Effective Date of the Agreement as provided in paragraph 6.06 of the General Conditions.
- 12.03 Contractor shall not be required to employ any Subcontractor, Supplier, individual, or entity against whom Contractor has reasonable objection.
- 12.04 The Contractor shall not award work to Subcontractor(s) in excess of the limits stated in SC 6.06.

## **ARTICLE 13 - PREPARATION OF BID**

- 13.01 The Bid form is included with the Bidding Documents. Additional copies may be obtained from Engineer.
- 13.02 All blanks on the Bid form shall be completed in ink and the Bid signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each Bid item listed therein.
- 13.03 A Bid by a corporation shall be executed in the corporate name by the president or a vice-president or other corporate officer accompanied by evidence of authority to sign. The corporate seal shall be affixed and attested by the secretary or an assistant

secretary. The corporate address and state of incorporation shall be provided on the Bid Form.

- 13.04 A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership shall be provided on the Bid Form.
- 13.05 A Bid by a limited liability company shall be executed in the name of the firm by a member and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown.
- 13.06 A Bid by an individual shall show the Bidder's name and business address.
- 13.07 A Bid by a joint venture shall be executed by each joint venturer in the manner indicated on the Bid form. The official address of the joint venture must be provided on the Bid Form.
- 13.08 All names shall be printed in ink below the signatures.
- 13.09 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers and dates of which shall be filled in on the Bid form.
- 13.10 The postal and email addresses and telephone number for communication regarding the Bid shall be shown.
- 13.11 The Bid shall contain evidence of Bidder's authority and qualification to do business in the state or locality where the Project is located or Bidder shall covenant in writing to obtain such qualification prior to award of the Contract and attach such covenant to the Bid. Bidder's state contractor license number, if any, shall also be shown on the Bid Form.

#### **ARTICLE 14 - BASIS OF BID; COMPARSION OF BIDS**

##### **14.01 Unit Price**

- A. Bidders shall submit a Bid on a unit price basis for each item of Work listed in the Bid schedule.
- B. The total of all bid prices will be the sum of the products of the estimated quantity of each item and the corresponding unit price. The final quantities and Contract Price will be determined in accordance with paragraph 11.03 of the General Conditions.
- A. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between words and figures will be resolved in favor of the words.

#### 14.02 Allowances

- A. For cash allowances the Bid price shall include such amounts as the Bidder deems proper for Contractor's overhead, costs, profit, and other expenses on account of cash allowances, if any, named in the Contract Documents, in accordance with Paragraph 11.02.B of the General Conditions.

### **ARTICLE 15 - SUBMITTAL OF BID**

- 15.01 The Bid Form is to be completed and submitted with all the attachments outlined in Article 7 of the Bid Form.
- 15.02 A Bid shall be submitted no later than the date and time prescribed and at the place indicated in the Advertisement for Bids and shall be enclosed in an opaque sealed envelope plainly marked with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted), the name and address of Bidder, and shall be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate envelope plainly marked on the outside with the notation "BID ENCLOSED." When using the mail or other delivery system, the Bidder is totally responsible for the mail or other delivery system delivering the Bid at the place and prior to the time indicated in the Advertisement for Bid. A mailed Bid shall be addressed to Owner at address in Article 1.01 of Bid Form.

### **ARTICLE 16 - MODIFICATION AND WITHDRAWAL OF BID**

- 16.01 A Bid may be modified or withdrawn by an appropriate document duly executed in the manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids.
- 16.02 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid or negotiated, that Bidder will be disqualified from further bidding on the Work. This provision to withdraw a Bid without forfeiting the Bid security does not apply to Bidder's errors in judgment in preparing the Bid.

### **ARTICLE 17 - OPENING OF BIDS**

- 17.01 Bids will be opened at the time and place indicated in the Advertisement for Bids and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

## **ARTICLE 18 - BIDS TO REMAIN SUBJECT TO ACCEPTANCE**

- 18.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, at its sole discretion, release any Bid and return the Bid security prior to the end of this period.

## **ARTICLE 19 - EVALUATION OF BIDS AND AWARD OF CONTRACT**

- 19.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner further reserves the right to reject the Bid of any Bidder whom it finds, after reasonable inquiry and evaluation, to be non-responsible. Owner also reserves the right to waive all informalities not involving price, time, or changes in the Work and to negotiate contract terms with the Successful Bidder.
- 19.02 More than one Bid for the same Work from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.
- 19.03 In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Form or prior to the Notice of Award.
- 19.04 In evaluating Bidders, Owner will consider the qualifications of Bidders and may consider the qualifications and experience of Subcontractors, Suppliers, and other individuals or entities proposed for those portions of the Work for which the identity of Subcontractors, Suppliers, and other individuals or entities must be submitted as provided in the Supplementary Conditions.
- 19.05 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, Suppliers, individuals, or entities to perform the Work in accordance with the contract Documents.
- 19.06 If the Contract is to be awarded, Owner will award the Contract to the responsible Bidder whose Bid, conforming with all the material terms and conditions of the Instructions to Bidders, is lowest, price and other factors considered. If detailed in the bid form, factors such as additive alternate bids, discounts, transportation costs, and life cycle costs may be used to determine which bidder, if any, is offered the award.

## **ARTICLE 20 - CONTRACT SECURITY AND INSURANCE**

- 20.01 Article 5 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment bonds and



insurance. When the Successful Bidder delivers the executed Agreement to Owner, it shall be accompanied by such bonds.

## **ARTICLE 21 - SIGNING OF AGREEMENT**

21.01 When Owner gives a Notice of Award to the Successful Bidder, it shall be accompanied by the required number of unsigned counterparts of the Agreement with the other Contract Documents which are identified in the Agreement as attached thereto. Within 60 days thereafter, Successful Bidder shall sign and deliver the required number of counterparts of the Agreement and attached documents to Owner. Within ten days thereafter, Owner shall deliver one fully signed counterpart to Successful Bidder with a complete set of the Drawings with appropriate identification.

## **ARTICLE 22 – CITY STANDARDS**

22.01 All work on this project shall conform to 2017 APWA Standards and Specifications or as listed in these project specifications. If there is a conflict, the more stringent standard will apply.

22.02 The Contractor will be required to conform to all requirements of Cottonwood Heights, including, but not limited to: traffic control, flagging, barricades, and all appurtenant items. The Contractor will be required to maintain open traffic lanes, as directed by the City inspector.

22.03 The Contractor will be required to conform to all requirements of Cottonwood Heights Notification Policy.

**Service Notifications:** The contractor is required to notify the following services at least two (2) working days prior to commencement of the Work via phone or written correspondence for all Department approved full road closures and lane closures: Cottonwood Heights Police Department, Utah Transit Authority, Unified Fire Authority, Canyons School District Transportation Department.

**Residents and Businesses:** The contractor is required to adhere to the following minimum notification requirements:

- Department Approved notification shall be delivered by hand to every residence and/or business fronting the Work and within two hundred fifty (250') feet of the Work. The notification shall contain the following: Description of Work and expected impacts to the business/resident; and Contact number and/or e-mail address to contact 24 hours with questions.

- Notify the residents and/or businesses along the road where the work is to be conducted at least Five (5) working days in advance of the Work.
- Provide weekly updated schedules to the city inspector for use on the city's web page and social media sites.
- Hold a public meeting with the affected residents and/or businesses when deemed necessary by the Public Works Department.
- Comply with the public communication plan as described in the project's specifications and requirements.

- END OF DOCUMENT -

## Bid Form

Project Identification:

Cottonwood Heights – City Wide Roadway Improvement Project

Contract Identification and Number: #004.21

### ARTICLE 1 - BID RECIPIENT

1.01 This Bid Is Submitted To: **COTTONWOOD HEIGHTS**

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in the Bid and in accordance with the other terms and conditions of the Bidding Documents.

### ARTICLE 2 - BIDDER'S ACKNOWLEDGMENTS

2.01 Bidder accepts all of the terms and conditions of the Advertisement and Instructions to Bidders, including without limitations those dealing with the dispositions of Bid security. The Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

### ARTICLE 3 - BIDDER'S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, the other related data identified in the Bidding Documents, and the following Addenda, receipt of which is hereby acknowledged:

| Addendum No.      | Addendum Date     |
|-------------------|-------------------|
| <u>1</u>          | <u>5/25/21</u>    |
| <u>          </u> | <u>          </u> |
| <u>          </u> | <u>          </u> |

B. Bidder has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and is satisfied as to all Federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) which have been identified in SC-4.02, and (2) reports and drawings of Hazard Environmental Conditions, if any, at the Site that have been identified in SC-4.06 as containing reliable "technical data."

- E. Bidder has considered the information known to Bidder; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents; and (3) Bidder's safety precautions and programs.
- F. Based on the information and observations referred to in Paragraph 3.01.E above, Bidder does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times and in accordance with the other terms and conditions of the Bidding Documents.
- G. Bidder is aware of the general nature of the Work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
- H. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by Engineer is acceptable to Bidder.
- I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.
- J. Bidder will submit written evidence of its authority to do business in the State or other jurisdiction where the Project is located not later than the date of its execution of the Agreement.

#### **ARTICLE 4 - BIDDER'S CERTIFICATION**

##### **4.01 Bidder further represents that:**

- A. This Bid is genuine and not made in the interest of or on the behalf of any undisclosed individual or entity and is not submitted in conformity with any agreement or rules of any group, association, organization, or corporation;
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and
- D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:
  - 1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;
  - 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices

at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and
4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

## ARTICLE 5 - BASIS OF BID

5.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

| <b><i>SCHEDULE "A" - RACQUET CLUB DRIVE AREA</i></b> |  |                        |                    |                          |                          |
|--|--|------------------------|--------------------|--------------------------|--------------------------|
| <b><u>Bid #</u></b>                                  | <b><u>Item Description</u></b>   | <b><u>Quantity</u></b> | <b><u>Unit</u></b> | <b><u>Unit Price</u></b> | <b><u>Total Cost</u></b> |
| 1  | Mobilization   | 1                      | LS                 |                          |                          |
| 2  | Traffic Control  | 1                      | LS                 |                          |                          |
| 3  | Furnish and install 4-inch white traffic paint, complete   | 5,000                  | LF                 |                          |                          |
| 4  | Furnish and install 12-inch white traffic paint for stop bar, complete   | 72                     | LF                 |                          |                          |
| 5  | Reconstruct existing water valve boxes to grade, complete  | 12                     | EA                 |                          |                          |
| 6  | Reconstruct existing sewer, storm drain, water, electric, and communications manholes to grade, complete                             | 32                     | EA                 |                          |                          |
| 7  | Reconstruct existing survey monuments to grade, complete   | 8                      | EA                 |                          |                          |
| 8  | Remove and replace existing 30-inch concrete curb & gutter, per city inspector, complete   | 500                    | LF                 |                          |                          |
| 9  | Remove Existing Asphalt Pavement, Lip of Gutter to Lip of Gutter, 4-inches thick, complete   | 242,220                | SF                 |                          |                          |
| 10   | Furnish, place and compact warm mix asphalt surface course, 4-inch thick, DM 1/2" 50 Blow, PG 58-28, Max RAP 15% by weight, complete | 242,220                | SF                 |                          |                          |

|                               |   |          |      |            |            |
|-------------------------------|---|----------|------|------------|------------|
| 11                            | Construct new 6-ft wide waterway & waterway transition structure (APWA Plan 211 & 213), complete, <u>at west side of Racquet Club Dr. &amp; Winesap Dr. Intersection.</u> , Including removing existing waterways, asphalt pavement, Curb and gutter as required; and all earthwork, new gravel road base; all concrete work, restoring concrete items, waterway improvements, <u>protect existing ADA Ramp, street sign, landscaping, irrigation;</u> and complete all other appurtenant work  | 1        | LS   |            |            |
| 12                            | Construct new (2) ADA Ramps (NW & SW Corner) (APWA Plan 235.1) & 4-ft wide waterway & waterway transition structure (East Side) (APWA Plan 211 & 213), complete, <u>at Winesap Rd. &amp; Pippen Dr. Intersection.</u> , Including removing existing curb and gutter, waterways, sidewalks, and asphalt pavement, as required; and all earthwork, new gravel road base; all concrete work and detectable warning panels; restoring concrete items, waterway improvements; <u>protect existing street sign, ADA Ramps, landscaping, irrigation;</u> and complete all other appurtenant work | 1        | LS   |            |            |
| 13                            | Construct new (4) ADA Ramps (APWA Plan 235.1) & (2) 4-ft wide waterways & waterway transition structures (APWA Plan 211 & 213), complete, <u>at 4 corners of Winesap Rd. &amp; Mackintosh Ln. intersection.</u> , Including removing existing curb and gutter, waterways, sidewalks, and asphalt pavement, as required; and all earthwork, new gravel road base; all concrete work and detectable warning panels; restoring concrete items, waterway improvements; <u>protect existing street sign, landscaping, irrigation;</u> and complete all other appurtenant work                  | 1        | LS   |            |            |
| 14                            | Construct new (2) ADA Ramps , APWA Plan 235.1), <u>at southeast &amp; southwest corner of Winesap Rd and Winesap Circle Intersection.</u> Including removing existing curb and gutter, sidewalks, and asphalt pavement, as required; and all earthwork, new gravel road base; all concrete work and detectable warning panels; restoring concrete items; <u>protect existing inlet boxes, fire hydrants, street signs, street light, landscaping, irrigation;</u> and complete all other appurtenant work   | 1        | LS   |            |            |
| Subtotal - SCHEDULE "A"       |   |          |      | \$         |            |
| SCHEDULE "B" - ALPEN WAY AREA |   |          |      |            |            |
| Bid #                         | Item Description  | Quantity | Unit | Unit Price | Total Cost |
| 1                             | Traffic Control   | 1        | LS   |            |            |
| 2                             | Reconstruct existing sewer, storm drain, water, electric, and communications manholes to grade, complete  | 18       | EA   |            |            |

|                                 |   |           |    |
|---------------------------------|---|-----------|----|
| 3                               | Reconstruct existing survey monuments to grade, complete  | 2         | EA |
| 4                               | Remove and replace existing 30-inch concrete curb & gutter, complete  | 500       | LF |
| 5                               | Remove Existing Asphalt Pavement, Lip of Gutter to Lip of Gutter, 5-inches deep, complete   | 83,100    | SF |
| 6                               | Furnish, place and compact warm mix asphalt surface course, 5-inch thick, DM 1/2" 50 Blow, PG 58-28, Max RAP 15% by weight, complete  | 83,100    | SF |
| 7                               | Construct new (2) ADA Ramps (best fit based on existing slope, APWA Plan 235.1) & 4-ft wide waterway & waterway transition structure (APWA Plan 211 & 213), complete, <u>at east side of Alpen Way &amp; Willow Canyon Dr. intersection.</u> Including removing existing curb and gutter, waterways, sidewalks, and asphalt pavement, as required; and all earthwork, new gravel road base; all concrete work and detectable warning panels; restoring concrete items, waterway improvements; <u>protect existing street sign, landscaping, irrigation;</u> and complete all other appurtenant work | 1         | LS |
| 8                               | Construct new (2) ADA Ramps (best fit based on existing slope, APWA Plan 235.1), <u>at northeast and southeast corner of Alpen Way &amp; Golden Hills Ave intersection.;</u> Including removing existing curb and gutter, sidewalks, and asphalt pavement, as required; and all earthwork, new gravel road base; all concrete work and detectable warning panels; restoring concrete items; <u>protect existing inlet boxes, fire hydrants, street signs, street light, landscaping, irrigation;</u> and complete all other appurtenant work  | 1         | LS |
| <b>Subtotal - SCHEDULE "B"</b>  |   | <b>\$</b> |    |
| <b>BID TOTAL (SCH A+SCH B.)</b> |   | <b>\$</b> |    |

Unit Prices have been computed in accordance with paragraph 11.03.B of the General Conditions.

Bidder acknowledges that estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Bid items will be based on actual quantities, determined as provided in the contract Documents.

## **ARTICLE 6 - TIME OF COMPLETION**

6.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with paragraph 15.06 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.

6.02 Bidder accepts the provisions of the Agreement as to liquidated damage.

## **ARTICLE 7 - ATTACHEMENTS TO THIS BID**

7.01 The following documents are attached to and made a condition of the Bid:

- A. Required Bid security in the form of a Bid Bond (EJCDC No. C-430) or Certified Check);
- B. Document 00 45 00 - List of Subcontractors;
- C. Evidence of authority to do business in the state or jurisdiction of the Project; or a written covenant to obtain such license within the time frame for acceptance of Bids.

## **ARTICLE 8 - DEFINED TERMS**

8.01 The terms used in this Bid with the initial capital letters have the meanings indicated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.



## ARTICLE 9 - BID SUBMITTAL

9.01 This Bid is submitted by:

If Bidder is:

### **An Individual**

Name (typed or printed): \_\_\_\_\_

By: \_\_\_\_\_  
(Individual's signature)

SEAL,  
if required  
by State

Doing business as:

\_\_\_\_\_

### **A Partnership**

Partnership Name: \_\_\_\_\_

By: \_\_\_\_\_  
(Signature of general partner -- attach evidence of authority to sign)

SEAL,  
if required  
by State

Name (typed or printed):

\_\_\_\_\_

### **A Corporation**

Corporation Name:

\_\_\_\_\_

State or Jurisdiction of Incorporation: \_\_\_\_\_

Type (General Business, Profession, Service, Limited Liability):

\_\_\_\_\_

By: \_\_\_\_\_  
(Signature -- attach evidence of authority to sign)

Name (typed or printed):

\_\_\_\_\_

Title: \_\_\_\_\_

Attest \_\_\_\_\_  
(Signature of Corporate Secretary)

CORPORATE  
SEAL,  
if required by State

Date of Qualification to do business in \_\_\_\_\_ [State or other jurisdiction where  
Project is located] is \_\_\_\_/\_\_\_\_/\_\_\_\_

## **A Joint Venture**

Name of Joint Venture: \_\_\_\_\_

First Joint Venture Name: \_\_\_\_\_

SEAL,  
if required  
by State

By: \_\_\_\_\_  
(Signature of joint venture partner -- attach evidence of authority to sign)

Name (typed or printed): \_\_\_\_\_

Title: \_\_\_\_\_

Second Joint Venture Name: \_\_\_\_\_

SEAL,  
if required  
by State

By: \_\_\_\_\_  
(Signature of joint venture partner -- attach evidence of authority to sign)

Name (typed or printed): \_\_\_\_\_

Title: \_\_\_\_\_

(Each joint venturer must sign. The manner of signing for each individual, partnership, and corporation that is party to the venture should be in the manner indicated above.)

Bidder's Business address: \_\_\_\_\_

Business Phone No. (\_\_\_\_\_)\_\_\_\_\_

Business FAX No. (\_\_\_\_\_)\_\_\_\_\_

Business E-Mail Address \_\_\_\_\_

State Contractor License No. \_\_\_\_\_. (If applicable)

Employer's Tax ID No. \_\_\_\_\_

Phone and FAX Numbers, and Address for receipt of official communications, if different from Business contact information: \_\_\_\_\_

9.02 Bid submitted on \_\_\_\_\_, 20\_\_\_\_.

**BID BOND**

Any singular reference to Bidder, Surety, Owner or other party shall be considered plural where applicable.

---

BIDDER (*Name and Address*):

SURETY (*Name and Address of Principal Place of Business*):

OWNER (*Name and Address*):

Cottonwood Heights  
2277 East Bengal Boulevard  
Cottonwood Heights, Utah 84121

BID

Bid Due Date:

Description:

BOND

Bond Number:

Date (*Not earlier than Bid due date*):

Penal sum

\_\_\_\_\_  
(Words)

\$

\_\_\_\_\_  
(Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

**BIDDER**

**SURETY**

\_\_\_\_\_  
Bidder's Name and Corporate Seal

(Seal)

\_\_\_\_\_  
Surety's Name and Corporate Seal

(Seal)

By:

\_\_\_\_\_  
Signature

By:

\_\_\_\_\_  
Signature (Attach Power of Attorney)

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

Attest:

\_\_\_\_\_  
Signature

Attest:

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

*Note: Above addresses are to be used for giving any required notice. Provide execution by any additional parties, such as joint venturers, if necessary.*

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond shall be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation shall be null and void if:
  - 3.1 Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
  - 3.2 All Bids are rejected by Owner, or
  - 3.3 Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.
6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after Bid due date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

**DOCUMENT 00 45 00**

**LIST OF SUBCONTRACTORS**

The bidder shall list below the names and business address of each subcontractor who will perform Work under this Contract in excess of five percent (0.05) of the total bid price and shall also list the portion of the work which will be done by such subcontractor. After the opening of proposals, no changes or substitutions will be allowed without the written approval of the Owner. NOTE: Attach additional sheets if required.

| <u>WORK TO BE PERFORMED</u> | <u>SUBCONTRACTOR'S NAME AND ADDRESS</u> |
|-----------------------------|---|
| 1. _____<br>_____           | _____<br>_____                          |
| 2. _____<br>_____           | _____<br>_____                          |
| 3. _____<br>_____           | _____<br>_____                          |
| 4. _____<br>_____           | _____<br>_____                          |
| 5. _____<br>_____           | _____<br>_____                          |
| 6. _____<br>_____           | _____<br>_____                          |

- END OF DOCUMENT -

**DOCUMENT 00 50 00**  
**Notice of Intent to Award**

Date:

Project: Cottonwood Heights –

Owner: Cottonwood Heights

Owner's Contract No.: 002-21

Contract:

Engineer's Project No.: 002-21

Bidder:

Bidder's Address:

You are hereby notified that your BID has been accepted for items in the amount of:

\$ \_\_\_\_\_.

You are required to return an acknowledged copy of this NOTICE OF INTENT TO AWARD to the OWNER.

Dated this 26 day of May **2020**.

Cottonwood Heights  
Owner

By \_\_\_\_\_

Title \_\_\_\_\_

**ACCEPTANCE OF NOTICE**

Receipt of the above NOTICE OF INTENT TO AWARD is hereby acknowledged

By \_\_\_\_\_

this the \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_

By \_\_\_\_\_

Title

Copy to Engineer

**Notice of Award**

Date: March 22<sup>nd</sup>, 2021

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Project: Cottonwood Heights – City Wide Slurry Seal Project 2020 -2021

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Owner: Cottonwood Heights

---

Owner's Contract No.: 002-21

---

Contract:

---

Engineer's Project No.: 002-21

---

Bidder:

---

Bidder's Address: 5464 West Leo Park Road, West Jordan, UT 84088

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You are notified that your Bid dated \_\_\_\_\_ for the above Contract has been considered. You are the Successful Bidder and are awarded a Contract

Three copies of the proposed Contract Documents (except Drawings) accompany this Notice of Award.

Drawings will be delivered separately or otherwise made available to you immediately.

You must comply with the following conditions precedent within 15 days of the date you receive this Notice of Award.

1. Deliver to the Owner three fully executed counterparts of the Contract Documents.
2. Deliver with the executed Contract Documents the Contract security [Bonds] as specified in the Instructions to Bidders (Article 20), General Conditions (Paragraph 5.01), and Supplementary Conditions (Paragraph SC-5.01).
3. Other conditions precedent:  
None

Failure to comply with these conditions within the time specified will entitle Owner to consider you in default, annul this Notice of Award, and declare your Bid security forfeited.

Within ten days after you comply with the above conditions, Owner will return to you one fully executed counterpart of the Contract Documents.

\_\_\_\_\_  
Cottonwood Heights  
Owner  
By: \_\_\_\_\_  
Authorized Signature  
\_\_\_\_\_  
Title

**Notice of Award**

Date: March 22<sup>nd</sup>, 2021

---

Project:

---

Owner:

---

Contract

---

Bidder:

---

Bidder'

---

---

You are notified that your Bid dated February 23<sup>rd</sup>, 2021 for the above Contract has been considered. You are the Successful Bidder and are awarded a Contract for City Wide Slurry Project – 002-21

Three copies of the proposed Contract Documents (except Drawings) accompany this Notice of Award.

Drawings will be delivered separately or otherwise made available to you immediately.

You must comply with the following conditions precedent within 15 days of the date you receive this Notice of Award.

1. Deliver to the Owner three fully executed counterparts of the Contract Documents.
2. Deliver with the executed Contract Documents the Contract security [Bonds] as specified in the Instructions to Bidders (Article 20), General Conditions (Paragraph 5.01), and Supplementary Conditions (Paragraph SC-5.01).
3. Other conditions precedent:  
None

Failure to comply with these conditions within the time specified will entitle Owner to consider you in default, annul this Notice of Award, and declare your Bid security forfeited.

Within ten days after you comply with the above conditions, Owner will return to you one fully executed counterpart of the Contract Documents.

Cottonwood Heights  
Owner  
By: \_\_\_\_\_  
Authorized Signature  
\_\_\_\_\_  
Title



# AGREEMENT

THIS AGREEMENT is by and between Cottonwood Heights (“Owner”) and  
 (“Contractor”).

Owner and Contractor hereby agree as follows:

## ARTICLE 1 – WORK

- 1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

*Mobilization, traffic control, and maintenance of traffic; reconstruction of miscellaneous structures to grade; all required earthwork; reconstruction of curb and gutter, sidewalks, driveway approaches, ADA access ramps; rotomilling and/or asphalt removal of existing pavement; placing and compacting new asphalt surface course; placing of tack coat and pavement reinforcement fabric; traffic paint striping, messages; and all appurtenant work; all in accordance with Drawings and Specifications prepared by the Engineer.*

## ARTICLE 2 – THE PROJECT

- 2.01 The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows: **004.21 - Cottonwood Heights – City Wide Roadway Improvement Project**

## ARTICLE 3 – ENGINEER

- 3.01 The Project has been designed by Engineer, which is to act as Owner's representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

## ARTICLE 4 – CONTRACT TIMES

- #### 4.01 *Time of the Essence*

- A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

- #### 4.02 *Dates for Substantial Completion*

The Contractor will commence the work required by the Contract Documents within ten (10) calendar days after the date of the Notice to Proceed; and will complete the same within Sixty (60) calendar days after the date of the Notice to Proceed; unless the period for completion is extended otherwise by the Contract Documents.

#### 4.03 Liquidated Damages

- A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial loss if the Work is not completed within the times specified in Paragraph 4.02 and 4.03 above, plus any extensions thereof allowed in accordance with Article 11 of the General Conditions. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty), Contractor shall pay Owner \$500.00 for each day that expires after the time specified in Paragraph 4.02 above for Substantial Completion until the Work is substantially complete. After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by Owner, Contractor shall pay Owner \$500.00 for each day that expires after the time specified in Paragraph 4.02 or 4.03 above for completion and readiness for final payment until the Work is completed and ready for final payment.

### ARTICLE 5 – CONTRACT PRICE

- 5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the sum of the amounts determined pursuant to Paragraphs 5.01.A below:

- A. For all Work, at the prices stated in Contractor's Bid, attached hereto as an exhibit.

### ARTICLE 6 – PAYMENT PROCEDURES

#### 6.01 *Submittal and Processing of Payments*

- A. Contractor shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

#### 6.02 *Progress Payments; Retainage*

- A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment on or about the 1st day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below. All such payments will be measured by the schedule of values established as provided in Paragraph 2.03.A of the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no schedule of values, as provided in the General Requirements.
1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Engineer may determine or Owner may withhold, including but not limited to liquidated damages, in accordance with Paragraph 15.01 of the General Conditions.

- a. 95% percent of Work completed (with the balance being retainage). If the Work has been 50 percent completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage; and
  - b. 95% percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).
- B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 97.5 percent of the Work completed, less such amounts as Engineer shall determine in accordance with Paragraph 15.01 of the General Conditions and less 100 percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the tentative list of items to be completed or corrected attached to the certificate of Substantial Completion.

#### 6.03 *Final Payment*

- A. Upon final completion and acceptance of the Work in accordance with Paragraph 15.05 of the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 15.06.

### **ARTICLE 7 – INTEREST**

- 7.01 All moneys not paid when due as provided in Article 15 of the General Conditions shall bear interest at the rate of N/A percent per annum.

### **ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS**

- 8.01 In order to induce Owner to enter into this Agreement, Contractor makes the following representations:
- A. Contractor has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.
  - B. Contractor has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
  - C. Contractor is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.
  - D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities), if any and (2) reports and drawings of Hazardous Environmental Conditions, if any.
  - E. Contractor has considered the information known to Contractor; information commonly known to contractors doing business in the locality of the Site; information and observations obtained

from visits to the Site; the Contract Documents; and the Site-related reports and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, including any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Contract Documents; and (3) Contractor's safety precautions and programs.

- F. Based on the information and observations referred to in Paragraph 8.01.E above, Contractor does not consider that further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.
- G. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
- H. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
- I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

## **ARTICLE 9 – CONTRACT DOCUMENTS**

### **9.01    *Contents***

- A. The Contract Documents consist of the following:
  - 1. This Agreement (pages 1 to 7, inclusive).
  - 2. Performance bond (pages 1 to 3, inclusive).
  - 3. Payment bond (pages 1 to 3, inclusive).
  - 4. General Conditions (pages 1 to 62, inclusive).
  - 5. Supplementary Conditions (pages 1 to 11, inclusive).
  - 6. Specifications as listed in the table of contents of the Project Manual. All work on this project shall conform to 2017 APWA Standards and Specifications or as listed in these project specifications. If there is a conflict, the more stringent standard will apply.
  - 7. Drawings with each sheet bearing the following general title: Slurry Seal Maps
  - 8. Addenda (numbers \_\_\_\_ to\_\_\_\_, inclusive).
  - 9. Exhibits to this Agreement (enumerated as follows):

- a. Contractor's Bid
  - b. Documentation submitted by Contractor prior to Notice of Award.
10. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:
- a. Notice to Proceed.
  - b. Work Change Directives.
  - c. Change Orders.
- B. The documents listed in Paragraph 9.01.A are attached to this Agreement (except as expressly noted otherwise above).
- C. There are no Contract Documents other than those listed above in this Article 9.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in Paragraph 3.04 of the General Conditions.

## **ARTICLE 10 – MISCELLANEOUS**

### **10.01 *Terms***

- A. Terms used in this Agreement will have the meanings stated in the General Conditions and the Supplementary Conditions.

### **10.02 *Assignment of Contract***

- A. No assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

### **10.03 *Successors and Assigns***

- A. Owner and Contractor each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

### **10.04 *Severability***

- A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be

valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

#### 10.05 *Contractor's Certifications*

- A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 10.05:
1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process or in the Contract execution;
  2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
  3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
  4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement. Counterparts have been delivered to Owner and Contractor. All portions of the Contract Documents have been signed or have been identified by Owner and Contractor or on their behalf.

This Agreement will be effective on \_\_\_\_\_(which is the Effective Date of the Agreement).

OWNER:

Cottonwood Heights

By: \_\_\_\_\_

Title: \_\_\_\_\_

Attest: \_\_\_\_\_

Title: \_\_\_\_\_

Address for giving notices:

Cottonwood Heights

2277 East Bengal Boulevard

Cottonwood Heights, Utah 84121

(If Owner is a corporation, attach evidence of authority to sign. If Owner is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)

CONTRACTOR

By: \_\_\_\_\_

Title: \_\_\_\_\_

(If Contractor is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest: \_\_\_\_\_

Title: \_\_\_\_\_

Address for giving notices:

License No.: \_\_\_\_\_

(Where applicable)

Agent for service of process:

**Change Order**

No. \_\_\_\_\_

Date of Issuance: \_\_\_\_\_ Effective Date: \_\_\_\_\_

|             |        |                         |
|-------------|--------|-------------------------|
| Project:    | Owner: | Owner's Contract No.:   |
| Contract:   |        | Date of Contract:       |
| Contractor: |        | Engineer's Project No.: |

**The Contract Documents are modified as follows upon execution of this Change Order:**

Description:

See attached unit price cost proposal dated \_\_\_\_\_

**Attachments (list documents supporting change):**

See attached unit price cost proposal dated \_\_\_\_\_

**CHANGE IN CONTRACT PRICE:**

Original Contract Price:

\_\_\_\_\_

Increase from previously approved Change Orders No. original to No. 1:

\_\_\_\_\_

Contract Price prior to this Change Order:

\_\_\_\_\_

Increase of this Change Order:

\_\_\_\_\_

Contract Price incorporating this Change Order:

\_\_\_\_\_

**CHANGE IN CONTRACT TIMES:**

Original Contract Times: ☐ Working days ☐ Calendar days

Substantial completion (days or date): \_\_\_\_\_

Ready for final payment (days or date): \_\_\_\_\_

[Increase] [Decrease] from previously approved Change Orders No. \_\_\_\_\_ to No. \_\_\_\_\_:

Substantial completion (days): \_\_\_\_\_

Ready for final payment (days): \_\_\_\_\_

Contract Times prior to this Change Order:

Substantial completion (days or date): \_\_\_\_\_

Ready for final payment (days or date): \_\_\_\_\_

[Increase] [Decrease] of this Change Order:

Substantial completion (days or date): \_\_\_\_\_

Ready for final payment (days or date): \_\_\_\_\_

Contract Times with all approved Change Orders:

Substantial completion (days or date): \_\_\_\_\_

Ready for final payment (days or date): \_\_\_\_\_

RECOMMENDED:

By: \_\_\_\_\_

Engineer (Authorized Signature)

Date: \_\_\_\_\_

Approved by Funding Agency (if applicable):

\_\_\_\_\_

ACCEPTED:

By: \_\_\_\_\_

Owner (Authorized Signature)

Date: \_\_\_\_\_

ACCEPTED:

By: \_\_\_\_\_

Contractor (Authorized Signature)

Date: \_\_\_\_\_

Date: \_\_\_\_\_



# **Change Order**

## **Instructions**

### **A. GENERAL INFORMATION**

This document was developed to provide a uniform format for handling contract changes that affect Contract Price or Contract Times. Changes that have been initiated by a Work Change Directive must be incorporated into a subsequent Change Order if they affect Price or Times.

Changes that affect Contract Price or Contract Times should be promptly covered by a Change Order. The practice of accumulating Change Orders to reduce the administrative burden may lead to unnecessary disputes.

If Milestones have been listed in the Agreement, any effect of a Change Order thereon should be addressed.

For supplemental instructions and minor changes not involving a change in the Contract Price or Contract Times, a Field Order should be used.

### **B. COMPLETING THE CHANGE ORDER FORM**

Engineer normally initiates the form, including a description of the changes involved and attachments based upon documents and proposals submitted by Contractor, or requests from Owner, or both.

Once Engineer has completed and signed the form, all copies should be sent to Owner or Contractor for approval, depending on whether the Change Order is a true order to the Contractor or the formalization of a negotiated agreement for a previously performed change. After approval by one contracting party, all copies should be sent to the other party for approval. Engineer should make distribution of executed copies after approval by both parties.

If a change only applies to price or to times, cross out the part of the tabulation that does not apply.

## **Notice to Proceed**

Date: 5/10/21

---

Project: Cottonwood Heights – City Wide Slurry Seal Project 2020 -2021

---

Owner: Cottonwood Heights

---

Owner's Contract No.: 002-21

---

Contract: City Wide Slurry Project – 002-21

---

Engineer's Project No.: 002-21

---

Contractor: M&M Asphalt Service, INC.

---

Contractor's Address: 5464 West Leo Park Road, West Jordan UT 84088

---

---

You are notified that the Contract Times under the above Contract will commence to run on May 17<sup>st</sup>, 2021. On or before that date, you are to start performing your obligations under the Contract Documents. In accordance with Article 4 of the Agreement, the date of Substantial Completion is July 16th, 2021.

Before you may start any Work at the Site, Paragraph 2.01.B of the General Conditions provides that you and Owner must each deliver to the other (with copies to Engineer and other identified additional insureds and loss payees) certificates of insurance which each is required to purchase and maintain in accordance with the Contract Documents.

Also, before you may start any Work at the Site, you must:

- Execute Contract document provided by the City
- Comply with the Notification Requirements per City Inspector

---

Owner

Given by:

---

Authorized Signature

---

Title

---

Date

**PERFORMANCE BOND**

Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

---

CONTRACTOR (*Name and Address*):                      SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):

Cottonwood Heights  
2277 East Bengal Boulevard  
Cottonwood Heights, Utah 84

**CONTRACT**

Effective Date of Agreement:  
Amount:  
Description (*Name and Location*):

**BOND**

Bond Number:  
Date (*Not earlier than Effective Date of Agreement*):  
Amount:  
Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

**CONTRACTOR AS PRINCIPAL**

**SURETY**

\_\_\_\_\_  
Contractor's Name and Corporate Seal

\_\_\_\_\_  
Surety's Name and Corporate Seal

By: \_\_\_\_\_  
Signature

By: \_\_\_\_\_  
Signature (Attach Power of Attorney)

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

Attest: \_\_\_\_\_  
Signature

Attest: \_\_\_\_\_  
Signature

---

Title

---

Title

*Note: Provide execution by additional parties, such as joint venturers, if necessary.*

Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner for the performance of the Contract, which is incorporated herein by reference.

1. If Contractor performs the Contract, Surety and Contractor have no obligation under this Bond, except to participate in conferences as provided in Paragraph 2.1.
2. If there is no Owner Default, Surety's obligation under this Bond shall arise after:
  - 2.1 Owner has notified Contractor and Surety, at the addresses described in Paragraph 9 below, that Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with Contractor and Surety to be held not later than 15 days after receipt of such notice to discuss methods of performing the Contract. If Owner, Contractor, and Surety agree, Contractor shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive Owner's right, if any, subsequently to declare a Contractor Default; and
  - 2.2 Owner has declared a Contractor Default and formally terminated Contractor's right to complete the Contract. Such Contractor Default shall not be declared earlier than 20 days after Contractor and Surety have received notice as provided in Paragraph 2.1; and
  - 2.3 Owner has agreed to pay the Balance of the Contract Price to:
    1. Surety in accordance with the terms of the Contract; or
    2. Another contractor selected pursuant to Paragraph 3.3 to perform the Contract.
3. When Owner has satisfied the conditions of Paragraph 2, Surety shall promptly, and at Surety's expense, take one of the following actions:
  - 3.1 Arrange for Contractor, with consent of Owner, to perform and complete the Contract; or
  - 3.2 Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or
  - 3.3 Obtain bids or negotiated proposals from qualified contractors acceptable to Owner for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by Owner and contractor selected with Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Contract, and pay to Owner the amount of damages as described in Paragraph 5 in excess of the Balance of the Contract Price incurred by Owner resulting from Contractor Default; or
  - 3.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:
    1. After investigation, determine the amount for which it may be liable to Owner and, as soon as practicable after the amount is determined, tender payment therefor to Owner; or
    2. Deny liability in whole or in part and notify Owner citing reasons therefor.
4. If Surety does not proceed as provided in Paragraph 3 with reasonable promptness, Surety shall be deemed to be in default on this Bond 15 days after receipt of an additional written notice from Owner to Surety demanding that Surety perform its obligations under this Bond, and Owner shall be entitled to enforce any remedy available to Owner. If Surety proceeds as provided in Paragraph 3.4, and Owner refuses the payment tendered or Surety has denied liability, in whole or in part, without further notice Owner shall be entitled to enforce any remedy available to Owner.
5. After Owner has terminated Contractor's right to complete the Contract, and if Surety elects to act under Paragraph 3.1, 3.2, or 3.3 above, then the responsibilities of Surety to Owner shall not be greater than those of Contractor under the Contract, and the responsibilities of Owner to Surety shall not be greater than those of Owner under the Contract. To the limit of the amount of this Bond, but subject to commitment by Owner of the Balance of the Contract Price to mitigation of costs and damages on the Contract, Surety is obligated without duplication for:

- 5.1 The responsibilities of Contractor for correction of defective Work and completion of the Contract;
- 5.2 Additional legal, design professional, and delay costs resulting from Contractor's Default, and resulting from the actions of or failure to act of Surety under Paragraph 3; and
- 5.3 Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of Contractor.

6. Surety shall not be liable to Owner or others for obligations of Contractor that are unrelated to the Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than Owner or its heirs, executors, administrators, or successors.

7. Surety hereby waives notice of any change, including changes of time, to Contract or to related subcontracts, purchase orders, and other obligations.

8. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located, and shall be instituted within two years after Contractor Default or within two years after Contractor ceased working or within two years after Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

9. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the address shown on the signature page.

10. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

#### 11. Definitions.

- 11.1 Balance of the Contract Price: The total amount payable by Owner to Contractor under the Contract after all proper adjustments have been made, including allowance to Contractor of any amounts received or to be received by Owner in settlement of insurance or other Claims for damages to which Contractor is entitled, reduced by all valid and proper payments made to or on behalf of Contractor under the Contract.
- 11.2 Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.
- 11.3 Contractor Default: Failure of Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.
- 11.4 Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract or to perform and complete or otherwise comply with the other terms thereof.

FOR INFORMATION ONLY – *(Name, Address and Telephone)*

Surety Agency or Broker:

Owner's Representative *(Engineer or other party)*:

**PAYMENT BOND**

Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

---

CONTRACTOR (*Name and Address*):

SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):

Cottonwood Heights  
2277 East Bengal Boulevard  
Cottonwood Heights, Utah 84121

**CONTRACT**

Effective Date of Agreement:

Amount:

Description (*Name and Location*):

**BOND**

Bond Number:

Date (*Not earlier than Effective Date of Agreement*):

Amount:

Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

**CONTRACTOR AS PRINCIPAL**

**SURETY**

\_\_\_\_\_  
Contractor's Name and Corporate Seal (Seal)

\_\_\_\_\_  
Surety's Name and Corporate Seal (Seal)

By: \_\_\_\_\_  
Signature

By: \_\_\_\_\_  
Signature (Attach Power of Attorney)

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

Attest: \_\_\_\_\_  
Signature

Attest: \_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

*Note: Provide execution by additional parties, such as joint venturers, if necessary.*

1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner to pay for labor, materials, and equipment furnished by Claimants for use in the performance of the Contract, which is incorporated herein by reference.
2. With respect to Owner, this obligation shall be null and void if Contractor:
  - 2.1 Promptly makes payment, directly or indirectly, for all sums due Claimants, and
  - 2.2 Defends, indemnifies, and holds harmless Owner from all claims, demands, liens, or suits alleging non-payment by Contractor by any person or entity who furnished labor, materials, or equipment for use in the performance of the Contract, provided Owner has promptly notified Contractor and Surety (at the addresses described in Paragraph 12) of any claims, demands, liens, or suits and tendered defense of such claims, demands, liens, or suits to Contractor and Surety, and provided there is no Owner Default.
3. With respect to Claimants, this obligation shall be null and void if Contractor promptly makes payment, directly or indirectly, for all sums due.
4. Surety shall have no obligation to Claimants under this Bond until:
  - 4.1 Claimants who are employed by or have a direct contract with Contractor have given notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.
  - 4.2 Claimants who do not have a direct contract with Contractor:
    1. Have furnished written notice to Contractor and sent a copy, or notice thereof, to Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials or equipment were furnished or supplied, or for whom the labor was done or performed; and
    2. Have either received a rejection in whole or in part from Contractor, or not received within 30 days of furnishing the above notice any communication from Contractor by which Contractor had indicated the claim will be paid directly or indirectly; and
    3. Not having been paid within the above 30 days, have sent a written notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to Contractor.
5. If a notice by a Claimant required by Paragraph 4 is provided by Owner to Contractor or to Surety, that is sufficient compliance.
6. When a Claimant has satisfied the conditions of Paragraph 4, the Surety shall promptly and at Surety's expense take the following actions:
  - 6.1 Send an answer to that Claimant, with a copy to Owner, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.
  - 6.2 Pay or arrange for payment of any undisputed amounts.
7. Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by Surety.
8. Amounts owed by Owner to Contractor under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any performance bond. By Contractor furnishing and Owner accepting this Bond, they agree that all funds earned by Contractor in the performance of the Contract are



dedicated to satisfy obligations of Contractor and Surety under this Bond, subject to Owner's priority to use the funds for the completion of the Work.

9. Surety shall not be liable to Owner, Claimants, or others for obligations of Contractor that are unrelated to the Contract. Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

10. Surety hereby waives notice of any change, including changes of time, to the Contract or to related subcontracts, purchase orders, and other obligations.

11. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the Work or part of the Work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Paragraph 4.1 or Paragraph 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the addresses shown on the signature page. Actual receipt of notice by Surety, Owner, or Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

13. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory Bond and not as a common law bond.

14. Upon request of any person or entity appearing to be a potential beneficiary of this Bond, Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

#### 15. Definitions

15.1 Claimant: An individual or entity having a direct contract with Contractor, or with a first-tier subcontractor of Contractor, to furnish labor, materials, or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Contract, architectural and engineering services required for performance of the Work of Contractor and Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

15.2 Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.

15.3 Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract, or to perform and complete or otherwise comply with the other terms thereof.

FOR INFORMATION ONLY – *(Name, Address, and Telephone)*

Surety Agency or Broker:

Owner's Representative *(Engineer or other)*:

\_\_\_\_\_

---

### Change Order Summary

\_\_\_\_\_

The undersigned Contractor certifies that to the best of its knowledge: (1) all previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with Work covered by prior Applications for Payment; (2) title of all Work, materials and equipment incorporated in said Work or otherwise listed in or covered by this Application for Payment will pass to Owner at time of payment free and clear of all Liens, security interests and encumbrances (except such as are covered by a Bond acceptable to Owner indemnifying Owner against any such Liens, security interest or encumbrances); and (3) all Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

[illegible]

Endorsed by the Construction Specifications Institute.

## Progress Estimate

## Contractor's Application

|                           |             |                 |                                    |             |  |   |               |                              |
|---------------------------|-------------|-----------------|------------------------------------|-------------|--|---|---------------|------------------------------|
| For (contract):           |             |                 |                                    |             | Application Number:                        |   |               |                              |
| Application Period:       |             |                 |                                    |             | Application Date:                          |   |               |                              |
| A                         |             | B               | Work Completed                     |             | E  | F   |               | G                            |
| Item                      |             | Scheduled Value | C                                  | D           | Materials Presently Stored (not in C or D) | Total Completed and Stored to Date<br>(C + D + E) | %<br>(E)<br>B | Balance to Finish<br>(B - F) |
| Specification Section No. | Description |                 | From Previous Application<br>(C+D) | This Period |  |   |               |                              |
|                           |             |                 |                                    |             |  |   |               |                              |
|                           | Totals      |                 |                                    |             |  |   |               |                              |

## Progress Estimate

## Contractor's Application

[illegible]



## Stored Material Summary

## Contractor's Application

|                     |                              |                       |                   |             |                   |                     |                      |             |   |
|---------------------|------------------------------|-----------------------|-------------------|-------------|-------------------|---------------------|----------------------|-------------|---|
| For (contract):     |                              |                       |                   |             |                   | Application Number: |                      |             |   |
| Application Period: |                              |                       |                   |             |                   | Application Date:   |                      |             |   |
| A                   | B                            | C                     | D                 |             | E                 |                     | F                    |             | G   |
| Invoice No.         | Shop Drawing Transmittal No. | Materials Description | Stored Previously |             | Stored this Month |                     | Incorporated in Work |             | Materials Remaining in Storage (\$) (D + E - F) |
|                     |                              |                       | Date (Month/Year) | Amount (\$) | Amount (\$)       | Subtotal            | Date (Month/Year)    | Amount (\$) |   |
|                     |                              |                       |                   |             |                   |                     |                      |             |   |
| Totals              |                              |                       |                   |             |                   |                     |                      |             |   |

## **Certificate of Substantial Completion**

Project:

Owner:

Owner's Contract No.:

Contract:

Engineer's Project No.:

**This [tentative] [definitive] Certificate of Substantial Completion applies to:**

☐ All Work under the Contract Documents:

☐ The following specified portions of the Work:

\_\_\_\_\_  
Date of Substantial Completion

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, and Engineer, and found to be substantially complete. The Date of Substantial Completion of the Project or portion thereof designated above is hereby declared and is also the date of commencement of applicable warranties required by the Contract Documents, except as stated below.

A [tentative] [definitive] list of items to be completed or corrected is attached hereto. This list may not be all-inclusive, and the failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

**The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance and warranties shall be as provided in the Contract Documents except as amended as follows:**

☐ Amended Responsibilities

☐ Not Amended

Owner's Amended Responsibilities:

Contractor's Amended Responsibilities:



The following documents are attached to and made part of this Certificate:

---

---

---

This Certificate does not constitute an acceptance of Work not in accordance with the Contract Documents nor is it a release of Contractor's obligation to complete the Work in accordance with the Contract Documents.

---

Executed by Engineer

---

Date

---

Accepted by Contractor

---

Date

---

Accepted by Owner

---

Date

## **Certificate of Final Acceptance**

Project:

Owner:

Owner's Contract No.:

Contract:

Engineer's Project No.:

**This [tentative] [definitive] Certificate of Final Completion applies to:**

☐ All Work under the Contract Documents:

☐ The following specified portions of the Work:

---

---

---

---

\_\_\_\_\_  
Date of Final Completion

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, and Engineer, and found to be complete.

The Date of Completion of the Work or portion thereof designated above is hereby established, subject to the provisions of the Contract pertaining to Final Acceptance.

**The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance and warranties shall be as provided in the Contract Documents except as amended as follows:**

☐ Amended Responsibilities

☐ Not Amended

Owner's Amended Responsibilities:

---

---

---

Contractor's Amended Responsibilities:

---

---

---

---

The following documents are attached to and made part of this Certificate:

---

---

---

|                              |            |
|------------------------------|------------|
| <hr/> Executed by Engineer   | <hr/> Date |
| <hr/> Accepted by Contractor | <hr/> Date |
| <hr/> Accepted by Owner      | <hr/> Date |

# STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by



Issued and Published Jointly by



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## ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

### 1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
  2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.
  3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
  4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
  5. *Bidder*—An individual or entity that submits a Bid to Owner.
  6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.
  7. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.
  8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.
  9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.
  10. *Claim*—(a) A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein: seeking an adjustment of Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract; or (b) a demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal; or seeking resolution of a contractual issue that Engineer

has declined to address. A demand for money or services by a third party is not a Claim.

11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. (“CERCLA”); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5501 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. (“RCRA”); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.
12. *Contract*—The entire and integrated written contract between the Owner and Contractor concerning the Work.
13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.
14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents. .
15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.
16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.
17. *Cost of the Work*—See Paragraph 13.01 for definition.
18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.
19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.
20. *Engineer*—The individual or entity named as such in the Agreement.
21. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.
22. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, does not establish a Hazardous Environmental Condition.
23. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

24. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
25. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date or by a time prior to Substantial Completion of all the Work.
26. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.
27. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.
28. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.
29. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.
30. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.
31. *Project Manual*—The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.
32. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative or "RPR" includes any assistants or field staff of Resident Project Representative.
33. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.
34. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals and the performance of related construction activities.
35. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.
36. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.

37. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands furnished by Owner which are designated for the use of Contractor.
38. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.
39. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.
40. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.
41. *Successful Bidder*—The Bidder whose Bid the Owner accepts, and to which the Owner makes an award of contract, subject to stated conditions.
42. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
43. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.
44. *Technical Data*—Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (a) subsurface conditions at the Site, or physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) or (b) Hazardous Environmental Conditions at the Site. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then the data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical or environmental report prepared for the Project and made available to Contractor are hereby defined as Technical Data with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06.
45. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including but not limited to those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
46. *Unit Price Work*—Work to be paid for on the basis of unit prices.
47. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

48. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

## 1.02 Terminology

- A. The words and terms discussed in the following paragraphs are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Intent of Certain Terms or Adjectives:*
1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.
- C. *Day:*
1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
- D. *Defective:*
1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
    - a. does not conform to the Contract Documents; or
    - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
    - c. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or 15.04).
- E. *Furnish, Install, Perform, Provide:*
1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
  2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
  4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.
- F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

## **ARTICLE 2 – PRELIMINARY MATTERS**

### **2.01 *Delivery of Bonds and Evidence of Insurance***

- A. *Bonds*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence of Contractor’s Insurance*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract), the certificates and other evidence of insurance required to be provided by Contractor in accordance with Article 6.
- C. *Evidence of Owner’s Insurance*: After receipt of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or otherwise), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

### **2.02 *Copies of Documents***

- A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.
- B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

### **2.03 *Before Starting Construction***

- A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise specifically required by the Contract Documents), Contractor shall submit to Engineer for timely review:
  1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;
  2. a preliminary Schedule of Submittals; and



3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

#### 2.04 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

#### 2.05 *Initial Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.03.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
  1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
  2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
  3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.

#### 2.06 *Electronic Transmittals*

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Shop Drawings and other submittals, in electronic media or digital format, either directly, or through access to a secure Project website.
- B. If the Contract does not establish protocols for electronic or digital transmittals, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the recipient's use of software application packages, operating systems, or

computer hardware differing from those used in the drafting or transmittal of the items, or from those established in applicable transmittal protocols.

### **ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE**

#### **3.01 *Intent***

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic or digital versions of the Contract Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version shall govern.
- D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.
- E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

#### **3.02 *Reference Standards***

- A. Standards Specifications, Codes, Laws and Regulations
  - 1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
  - 2. No provision of any such standard specification, manual, reference standard, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

#### **3.03 *Reporting and Resolving Discrepancies***

- A. *Reporting Discrepancies:*
  - 1. *Contractor's Verification of Figures and Field Measurements:* Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict,

error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.

2. *Contractor's Review of Contract Documents:* If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies:*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:
  - a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or
  - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

- A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work thereunder.
- B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.
- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly give written notice to Owner and Contractor that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

### 3.05 *Reuse of Documents*

- A. Contractor and its Subcontractors and Suppliers shall not:
  - 1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or
  - 2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

## **ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK**

### 4.01 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Contract, whichever date is earlier.

### 4.02 *Starting the Work*

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to such date.

### 4.03 *Reference Points*

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

### 4.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.
  - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 11.
- B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

#### 4.05 *Delays in Contractor's Progress*

- A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Times and Contract Price. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.
- C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:
  1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
  2. abnormal weather conditions;
  3. acts or failures to act of utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and
  4. acts of war or terrorism.
- D. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5.
- E. Paragraph 8.03 governs delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.
- F. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor.

- G. Contractor must submit any Change Proposal seeking an adjustment in Contract Price or Contract Times under this paragraph within 30 days of the commencement of the delaying, disrupting, or interfering event.

## **ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS**

### **5.01 *Availability of Lands***

- A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.
- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

### **5.02 *Use of Site and Other Areas***

#### **A. *Limitation on Use of Site and Other Areas:***

- 1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.
- 2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.12, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or at law; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part

by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

- B. *Removal of Debris During Performance of the Work:* During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.
- C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.
- D. *Loading of Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

### 5.03 *Subsurface and Physical Conditions*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
  - 1. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site;
  - 2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities); and
  - 3. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:
  - 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
  - 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
  - 3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

#### 5.04 *Differing Subsurface or Physical Conditions*

- A. *Notice by Contractor:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site either:
1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate; or
  2. is of such a nature as to require a change in the Drawings or Specifications; or
  3. differs materially from that shown or indicated in the Contract Documents; or
  4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

- B. *Engineer's Review:* After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine the necessity of Owner's obtaining additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A above; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- C. *Owner's Statement to Contractor Regarding Site Condition:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.
- D. *Possible Price and Times Adjustments:*
1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
    - a. such condition must fall within any one or more of the categories described in Paragraph 5.04.A;
    - b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,



- c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
  - a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise; or
  - b. the existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
  - c. Contractor failed to give the written notice as required by Paragraph 5.04.A.
3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

#### 5.05 *Underground Facilities*

- A. *Contractor's Responsibilities:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or adjacent to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:
  1. Owner and Engineer do not warrant or guarantee the accuracy or completeness of any such information or data provided by others; and
  2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
    - a. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
    - b. locating all Underground Facilities shown or indicated in the Contract Documents as being at the Site;
    - c. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
    - d. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.
- B. *Notice by Contractor:* If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, then Contractor shall, promptly after

becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.

- C. *Engineer's Review:* Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the Underground Facility in question; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and advise Owner in writing of Engineer's findings, conclusions, and recommendations. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
- D. *Owner's Statement to Contractor Regarding Underground Facility:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question, addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.
- E. *Possible Price and Times Adjustments:*
  - 1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
    - a. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;
    - b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;
    - c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times; and
    - d. Contractor gave the notice required in Paragraph 5.05.B.
  - 2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
  - 3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

5.06 *Hazardous Environmental Conditions at Site*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
1. those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
  2. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
  2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
  3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.
- D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.
- E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

- F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.
- G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off.
- H. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.
- I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.H shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

## ARTICLE 6 – BONDS AND INSURANCE

### 6.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of all of Contractor's obligations under the Contract. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the Supplementary Conditions, or other specific provisions of the Contract. Contractor shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.
- B. All bonds shall be in the form prescribed by the Contract except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.
- C. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.
- D. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the bond and surety requirements above.
- E. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.
- F. Upon request, Owner shall provide a copy of the payment bond to any Subcontractor, Supplier, or other person or entity claiming to have furnished labor or materials used in the performance of the Work.

### 6.02 *Insurance—General Provisions*

- A. Owner and Contractor shall obtain and maintain insurance as required in this Article and in the Supplementary Conditions.
- B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.
- C. Contractor shall deliver to Owner, with copies to each named insured and additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Contractor has obtained and is

maintaining the policies, coverages, and endorsements required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

- D. Owner shall deliver to Contractor, with copies to each named insured and additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- E. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- F. If either party does not purchase or maintain all of the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.
- G. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 16.
- H. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price shall be adjusted accordingly.
- I. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests.
- J. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner and other individuals and entities in the Contract.

#### 6.03 *Contractor's Insurance*

- A. *Workers' Compensation:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance for:
  - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts.
  - 2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).
  - 3. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states).

4. Foreign voluntary worker compensation (if applicable).
- B. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against:
1. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees.
  2. claims for damages insured by reasonably available personal injury liability coverage.
  3. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.
- C. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy shall be written on a 1996 (or later) ISO commercial general liability form (occurrence form) and include the following coverages and endorsements:
1. Products and completed operations coverage:
    - a. Such insurance shall be maintained for three years after final payment.
    - b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
  2. Blanket contractual liability coverage, to the extent permitted by law, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
  3. Broad form property damage coverage.
  4. Severability of interest.
  5. Underground, explosion, and collapse coverage.
  6. Personal injury coverage.
  7. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together); or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent.
  8. For design professional additional insureds, ISO Endorsement CG 20 32 07 04, "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.
- D. *Automobile liability:* Contractor shall purchase and maintain automobile liability insurance against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis.
- E. *Umbrella or excess liability:* Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the paragraphs above. Subject to industry-standard exclusions, the coverage afforded shall follow form as to each and every one of the underlying policies.
- F. *Contractor's pollution liability insurance:* Contractor shall purchase and maintain a policy covering third-party injury and property damage claims, including clean-up costs, as a result

of pollution conditions arising from Contractor's operations and completed operations. This insurance shall be maintained for no less than three years after final completion.

- G. *Additional insureds*: The Contractor's commercial general liability, automobile liability, umbrella or excess, and pollution liability policies shall include and list as additional insureds Owner and Engineer, and any individuals or entities identified in the Supplementary Conditions; include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds; and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis. Contractor shall obtain all necessary endorsements to support these requirements.
- H. *Contractor's professional liability insurance*: If Contractor will provide or furnish professional services under this Contract, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance shall provide protection against claims arising out of performance of professional design or related services, and caused by a negligent error, omission, or act for which the insured party is legally liable. It shall be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. If such professional design services are performed by a Subcontractor, and not by Contractor itself, then the requirements of this paragraph may be satisfied through the purchasing and maintenance of such insurance by such Subcontractor.
- I. *General provisions*: The policies of insurance required by this Paragraph 6.03 shall:
  - 1. include at least the specific coverages provided in this Article.
  - 2. be written for not less than the limits of liability provided in this Article and in the Supplementary Conditions, or required by Laws or Regulations, whichever is greater.
  - 3. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 10 days prior written notice has been given to Contractor. Within three days of receipt of any such written notice, Contractor shall provide a copy of the notice to Owner, Engineer, and each other insured under the policy.
  - 4. remain in effect at least until final payment (and longer if expressly required in this Article) and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract Documents.
  - 5. be appropriate for the Work being performed and provide protection from claims that may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable.
- J. The coverage requirements for specific policies of insurance must be met by such policies, and not by reference to excess or umbrella insurance provided in other policies.



#### 6.04 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 6.03, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.
- B. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

#### 6.05 *Property Insurance*

- A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the full insurable replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
  - 1. include the Owner and Contractor as named insureds, and all Subcontractors, and any individuals or entities required by the Supplementary Conditions to be insured under such builder's risk policy, as insureds or named insureds. For purposes of the remainder of this Paragraph 6.05, Paragraphs 6.06 and 6.07, and any corresponding Supplementary Conditions, the parties required to be insured shall collectively be referred to as "insureds."
  - 2. be written on a builder's risk "all risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire; lightning; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; water damage (other than that caused by flood); and such other perils or causes of loss as may be specifically required by the Supplementary Conditions. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance may be provided through other insurance policies acceptable to Owner and Contractor.
  - 3. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.
  - 4. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects).

5. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).
  6. extend to cover damage or loss to insured property while in transit.
  7. allow for partial occupation or use of the Work by Owner, such that those portions of the Work that are not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
  8. allow for the waiver of the insurer's subrogation rights, as set forth below.
  9. provide primary coverage for all losses and damages caused by the perils or causes of loss covered.
  10. not include a co-insurance clause.
  11. include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.
  12. include performance/hot testing and start-up.
  13. be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work is complete.
- B. *Notice of Cancellation or Change:* All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured.
- C. *Deductibles:* The purchaser of any required builder's risk or property insurance shall pay for costs not covered because of the application of a policy deductible.
- D. *Partial Occupancy or Use by Owner:* If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide notice of such occupancy or use to the builder's risk insurer. The builder's risk insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may come off the builder's risk policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
- E. *Additional Insurance:* If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.05, it may do so at Contractor's expense.
- F. *Insurance of Other Property:* If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a Subcontractor, or an employee of Contractor or a Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.

#### 6.06 *Waiver of Rights*

- A. All policies purchased in accordance with Paragraph 6.05, expressly including the builder's risk policy, shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all Subcontractors, all individuals or entities identified in the Supplementary Conditions as insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.
- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for:
  - 1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
  - 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 6.06.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them.
- D. Contractor shall be responsible for assuring that the agreement under which a Subcontractor performs a portion of the Work contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by builder's risk insurance and any other property insurance applicable to the Work.

#### 6.07 *Receipt and Application of Property Insurance Proceeds*

- A. Any insured loss under the builder's risk and other policies of insurance required by Paragraph 6.05 will be adjusted and settled with the named insured that purchased the

policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.

- B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.05 shall distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.
- C. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and the cost thereof covered by Change Order, if needed.

## **ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES**

### **7.01   *Supervision and Superintendence***

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

### **7.02   *Labor; Working Hours***

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

### **7.03   *Services, Materials, and Equipment***

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.
- B. All materials and equipment incorporated into the Work shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and

guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

#### 7.04 "Or Equals"

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment, or items from other proposed suppliers under the circumstances described below.
  - 1. If Engineer in its sole discretion determines that an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer shall deem it an "or equal" item. For the purposes of this paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:
    - a. in the exercise of reasonable judgment Engineer determines that:
      - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
      - 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
      - 3) it has a proven record of performance and availability of responsive service; and
      - 4) it is not objectionable to Owner.
    - b. Contractor certifies that, if approved and incorporated into the Work:
      - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
      - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.
- B. *Contractor's Expense:* Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.
- C. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal", which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.

- D. *Effect of Engineer's Determination:* Neither approval nor denial of an "or-equal" request shall result in any change in Contract Price. The Engineer's denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.
- E. *Treatment as a Substitution Request:* If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the proposed item as a substitute pursuant to Paragraph 7.05.

#### 7.05 Substitutes

- A. Unless the specification or description of an item of material or equipment required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment under the circumstances described below. To the extent possible such requests shall be made before commencement of related construction at the Site.
  - 1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of material or equipment from anyone other than Contractor.
  - 2. The requirements for review by Engineer will be as set forth in Paragraph 7.05.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.
  - 3. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
    - a. shall certify that the proposed substitute item will:
      - 1) perform adequately the functions and achieve the results called for by the general design,
      - 2) be similar in substance to that specified, and
      - 3) be suited to the same use as that specified.
    - b. will state:
      - 1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times,
      - 2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and
      - 3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
    - c. will identify:
      - 1) all variations of the proposed substitute item from that specified, and

- 2) available engineering, sales, maintenance, repair, and replacement services.
- d. shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.
- B. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.
- C. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- D. *Reimbursement of Engineer's Cost:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.
- E. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute at Contractor's expense.
- F. *Effect of Engineer's Determination:* If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.05.D, by timely submittal of a Change Proposal.

#### 7.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner.
- B. Contractor shall retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of designated parts of the Work if required by the Contract to do so.
- C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against which Contractor has reasonable objection.
- D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable, during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within five days.

- E. Owner may require the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors, Suppliers, or other individuals or entities for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor, Supplier, or other individual or entity so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity.
- F. If Owner requires the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, or both, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.
- G. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.
- H. On a monthly basis Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions.
- J. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.
- K. Contractor shall restrict all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed herein.
- L. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- M. All Work performed for Contractor by a Subcontractor or Supplier shall be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.
- N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.



O. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier, or other individual or entity; nor
2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

7.07 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.08 *Permits*

- A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work

#### 7.09 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

#### 7.10 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It shall not be Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Owner or Contractor may give notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

#### 7.11 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

#### 7.12 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:
  - 1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
  3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.
  - C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.
  - D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
  - E. All damage, injury, or loss to any property referred to in Paragraph 7.12.A.2 or 7.12.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
  - F. Contractor's duties and responsibilities for safety and protection shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 15.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).
  - G. Contractor's duties and responsibilities for safety and protection shall resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

#### 7.13 *Safety Representative*

- A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

#### 7.14 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or

exchanged between or among employers at the Site in accordance with Laws or Regulations.

#### 7.15 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

#### 7.16 *Shop Drawings, Samples, and Other Submittals*

##### A. *Shop Drawing and Sample Submittal Requirements:*

- 1. Before submitting a Shop Drawing or Sample, Contractor shall have:
  - a. reviewed and coordinated the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
  - b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
  - c. determined and verified the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
  - d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.
- 2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that submittal, and that Contractor approves the submittal.
- 3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review and approval of each such variation.

- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals. Each submittal will be identified as Engineer may require.

##### 1. *Shop Drawings:*

- a. Contractor shall submit the number of copies required in the Specifications.
- b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to

provide and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.D.

2. *Samples:*

- a. Contractor shall submit the number of Samples required in the Specifications.
- b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 7.16.D.

3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Other Submittals:* Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.

D. *Engineer's Review:*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto.
3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
4. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Contract Documents in a Field Order.
5. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 7.16.A and B.
6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, shall not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
7. Neither Engineer's receipt, review, acceptance or approval of a Shop Drawing, Sample, or other submittal shall result in such item becoming a Contract Document.

8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.D.4.

E. *Resubmittal Procedures:*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.
2. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.
3. If Contractor requests a change of a previously approved submittal item, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

7.17 *Contractor's General Warranty and Guarantee*

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
  1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
  2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
  1. observations by Engineer;
  2. recommendation by Engineer or payment by Owner of any progress or final payment;
  3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
  4. use or occupancy of the Work or any part thereof by Owner;
  5. any review and approval of a Shop Drawing or Sample submittal;
  6. the issuance of a notice of acceptability by Engineer;
  7. any inspection, test, or approval by others; or
  8. any correction of defective Work by Owner.

- D. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract shall govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

#### 7.18 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.
- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 7.18.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
  - 1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
  - 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

#### 7.19 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable Laws and Regulations.
- B. If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, and other submittals prepared by such professional. Shop

Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this paragraph, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 7.16.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

## **ARTICLE 8 – OTHER WORK AT THE SITE**

### **8.01 *Other Work***

- A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.
- B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any utility work at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford each other contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.
- D. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 8, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.



## 8.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:
  - 1. the identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;
  - 2. an itemization of the specific matters to be covered by such authority and responsibility; and
  - 3. the extent of such authority and responsibilities.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

## 8.03 *Legal Relationships*

- A. If, in the course of performing other work at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment shall take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract. When applicable, any such equitable adjustment in Contract Price shall be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due to Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this paragraph.
- C. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due to Contractor.

- D. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

## **ARTICLE 9 – OWNER'S RESPONSIBILITIES**

### **9.01    *Communications to Contractor***

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

### **9.02    *Replacement of Engineer***

- A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents shall be that of the former Engineer.

### **9.03    *Furnish Data***

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

### **9.04    *Pay When Due***

- A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

### **9.05    *Lands and Easements; Reports, Tests, and Drawings***

- A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.
- B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
- C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

### **9.06    *Insurance***

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

### **9.07    *Change Orders***

- A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *Limitations on Owner's Responsibilities*

- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

9.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.
- B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

**ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION**

10.01 *Owner's Representative*

- A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.

10.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.08. Particularly, but without limitation, during

or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Project Representative*

- A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 10.08. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent, or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

10.04 *Rejecting Defective Work*

- A. Engineer has the authority to reject Work in accordance with Article 14.

10.05 *Shop Drawings, Change Orders and Payments*

- A. Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, are set forth in Paragraph 7.16.
- B. Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, are set forth in Paragraph 7.19.
- C. Engineer's authority as to Change Orders is set forth in Article 11.
- D. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.06 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

10.07 *Decisions on Requirements of Contract Documents and Acceptability of Work*

- A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.08 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 15.06.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 10.08 shall also apply to the Resident Project Representative, if any.

#### 10.09 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs (if any) of which Engineer has been informed.

### **ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK**

#### 11.01 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
  - 1. *Change Orders:*
    - a. If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.
    - b. Owner and Contractor may amend those terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, without the recommendation of the Engineer. Such an amendment shall be set forth in a Change Order.
  - 2. *Work Change Directives:* A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.04 regarding change of Contract Price. Contractor must submit any Change Proposal seeking an

adjustment of the Contract Price or the Contract Times, or both, no later than 30 days after the completion of the Work set out in the Work Change Directive. Owner must submit any Claim seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 60 days after issuance of the Work Change Directive.

3. *Field Orders*: Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

#### 11.02 *Owner-Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Such changes shall be supported by Engineer's recommendation, to the extent the change involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters. Such changes may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

#### 11.03 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.

#### 11.04 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall comply with the provisions of Article 12.
- B. An adjustment in the Contract Price will be determined as follows:
  1. where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03); or
  2. where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.04.C.2); or
  3. where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on

the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.04.C).

- C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit shall be determined as follows:
1. a mutually acceptable fixed fee; or
  2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
    - a. for costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;
    - b. for costs incurred under Paragraph 13.01.B.3, the Contractor's fee shall be five percent;
    - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.01.C.2.a and 11.01.C.2.b is that the Contractor's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.A.1 and 13.01.A.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of five percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted work the maximum total fee to be paid by Owner shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;
    - d. no fee shall be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
    - e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
    - f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.04.C.2.a through 11.04.C.2.e, inclusive.

#### 11.05 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment in the Contract Times shall comply with the provisions of Article 12.
- B. An adjustment of the Contract Times shall be subject to the limitations set forth in Paragraph 4.05, concerning delays in Contractor's progress.

#### 11.06 *Change Proposals*

- A. Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; appeal an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; contest a set-off against payment due; or seek other relief under

the Contract. The Change Proposal shall specify any proposed change in Contract Times or Contract Price, or both, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents.

1. *Procedures:* Contractor shall submit each Change Proposal to Engineer promptly (but in no event later than 30 days) after the start of the event giving rise thereto, or after such initial decision. The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal. The supporting data shall be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event. Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal.
  2. *Engineer's Action:* Engineer will review each Change Proposal and, within 30 days after receipt of the Contractor's supporting data, either deny the Change Proposal in whole, approve it in whole, or deny it in part and approve it in part. Such actions shall be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.
  3. *Binding Decision:* Engineer's decision will be final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- B. *Resolution of Certain Change Proposals:* If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice shall be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

#### 11.07 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders covering:
1. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;
  2. changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;
  3. changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.02, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and
  4. changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.



- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

#### 11.08 *Notification to Surety*

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

### ARTICLE 12 – CLAIMS

#### 12.01 *Claims*

- A. *Claims Process:* The following disputes between Owner and Contractor shall be submitted to the Claims process set forth in this Article:
  - 1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;
  - 2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents; and
  - 3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters.
- B. *Submittal of Claim:* The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim shall rest with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, or both, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.
- C. *Review and Resolution:* The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim shall be stated in writing and submitted to the other party, with a copy to Engineer.
- D. *Mediation:*
  - 1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate shall stay the Claim submittal and response process.
  - 2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process shall resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim

submittal and decision process shall resume as of the date of the conclusion of the mediation, as determined by the mediator.

3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.
- E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action shall be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.
- F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim shall be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.
- G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim shall be incorporated in a Change Order to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

## **ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK**

### **13.01 Cost of the Work**

- A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:
  1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or
  2. To determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
- B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 13.01.C, and shall include only the following items:
  1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, and vacation and holiday pay applicable

thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.
4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
  - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
  - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
  - c. Rentals of all construction equipment and machinery, and the parts thereof, whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
  - d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
  - e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
  - f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 6.05), provided such losses and damages have resulted from causes

other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.
- i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

C. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

- 1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.
- 2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
- 3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
- 4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
- 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee:* When the Work as a whole is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 11.04.C.

E. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

## 13.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

- B. *Cash Allowances*: Contractor agrees that:
  - 1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
  - 2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.
- C. *Contingency Allowance*: Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

### 13.03 *Unit Price Work*

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of the following paragraph.
- E. Within 30 days of Engineer's written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price if:
  - 1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement;
  - 2. there is no corresponding adjustment with respect to any other item of Work; and
  - 3. Contractor believes that it is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price, and the parties are unable to agree as to the amount of any such increase or decrease.

## **ARTICLE 14 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK**

### **14.01 Access to Work**

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

### **14.02 Tests, Inspections, and Approvals**

- A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.
- B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work shall be governed by the provisions of Paragraph 14.05.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:
  - 1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
  - 2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
  - 3. by manufacturers of equipment furnished under the Contract Documents;
  - 4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
  - 5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests shall be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.
- F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering shall be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to

cover the same and Engineer had not acted with reasonable promptness in response to such notice.

#### 14.03 *Defective Work*

- A. *Contractor's Obligation:* It is Contractor's obligation to assure that the Work is not defective.
- B. *Engineer's Authority:* Engineer has the authority to determine whether Work is defective, and to reject defective Work.
- C. *Notice of Defects:* Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.
- D. *Correction, or Removal and Replacement:* Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.
- E. *Preservation of Warranties:* When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.
- F. *Costs and Damages:* In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

#### 14.04 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work shall be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

#### 14.05 *Uncovering Work*

- A. Engineer has the authority to require special inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.

- B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.
- C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.
  - 1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.
  - 2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

#### 14.06 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

#### 14.07 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, then Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.
- C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will



include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

## **ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD**

### **15.01 Progress Payments**

- A. *Basis for Progress Payments:* The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.
- B. *Applications for Payments:*
  - 1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens, and evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
  - 2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
  - 3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.
- C. *Review of Applications:*
  - 1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
  - 2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

- a. the Work has progressed to the point indicated;
  - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and
  - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
- a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or
  - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
- a. to supervise, direct, or control the Work, or
  - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
  - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
  - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid on account of the Contract Price, or
  - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.
6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
- a. the Work is defective, requiring correction or replacement;
  - b. the Contract Price has been reduced by Change Orders;
  - c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
  - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or

- e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due:*

- 1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. *Reductions in Payment by Owner:*

- 1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
  - a. claims have been made against Owner on account of Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;
  - b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;
  - c. Contractor has failed to provide and maintain required bonds or insurance;
  - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;
  - e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
  - f. the Work is defective, requiring correction or replacement;
  - g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
  - h. the Contract Price has been reduced by Change Orders;
  - i. an event that would constitute a default by Contractor and therefore justify a termination for cause has occurred;
  - j. liquidated damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;
  - k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
  - l. there are other items entitling Owner to a set off against the amount recommended.
- 2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount

remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed shall be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 15.01.C.1 and subject to interest as provided in the Agreement.

#### 15.02 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than seven days after the time of payment by Owner.

#### 15.03 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.
- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which shall fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.

- E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.
- F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

#### 15.04 *Partial Use or Occupancy*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:
  - 1. At any time Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through E for that part of the Work.
  - 2. At any time Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
  - 3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
  - 4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.05 regarding builder's risk or other property insurance.

#### 15.05 *Final Inspection*

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

#### 15.06 *Final Payment*

- A. *Application for Payment:*
  - 1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of

inspection, annotated record documents (as provided in Paragraph 7.11), and other documents, Contractor may make application for final payment.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:
  - a. all documentation called for in the Contract Documents;
  - b. consent of the surety, if any, to final payment;
  - c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.
  - d. a list of all disputes that Contractor believes are unsettled; and
  - e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

**B. *Engineer's Review of Application and Acceptance:***

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to the provisions of Paragraph 15.07. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

**C. *Completion of Work:*** The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.

**D. *Payment Becomes Due:*** Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation,

including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

#### 15.07 *Waiver of Claims*

- A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from Contractor's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from outstanding Claims by Owner, or from Contractor's continuing obligations under the Contract Documents.
- B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted or appealed under the provisions of Article 17.

#### 15.08 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents, or by any specific provision of the Contract Documents), any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
  - 1. correct the defective repairs to the Site or such other adjacent areas;
  - 2. correct such defective Work;
  - 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
  - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others).
- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

- E. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

## **ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION**

### **16.01 *Owner May Suspend Work***

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension. Any Change Proposal seeking such adjustments shall be submitted no later than 30 days after the date fixed for resumption of Work.

### **16.02 *Owner May Terminate for Cause***

- A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:
  - 1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule);
  - 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
  - 3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
  - 4. Contractor's repeated disregard of the authority of Owner or Engineer.
- B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) ten days written notice that Owner is considering a declaration that Contractor is in default and termination of the contract, Owner may proceed to:
  - 1. declare Contractor to be in default, and give Contractor (and any surety) notice that the Contract is terminated; and
  - 2. enforce the rights available to Owner under any applicable performance bond.
- C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.
- D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
- E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses,



and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

- F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

#### 16.03 *Owner May Terminate For Convenience*

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
  - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
  - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and
  - 3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.
- B. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.

#### 16.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for

expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

## **ARTICLE 17 – FINAL RESOLUTION OF DISPUTES**

### **17.01 *Methods and Procedures***

- A. *Disputes Subject to Final Resolution:* The following disputed matters are subject to final resolution under the provisions of this Article:
  - 1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full; and
  - 2. Disputes between Owner and Contractor concerning the Work or obligations under the Contract Documents, and arising after final payment has been made.
- B. *Final Resolution of Disputes:* For any dispute subject to resolution under this Article, Owner or Contractor may:
  - 1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions; or
  - 2. agree with the other party to submit the dispute to another dispute resolution process; or
  - 3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

## **ARTICLE 18 – MISCELLANEOUS**

### **18.01 *Giving Notice***

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:
  - 1. delivered in person, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or
  - 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the sender of the notice.

### **18.02 *Computation of Times***

- A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

### **18.03 *Cumulative Remedies***

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 *Limitation of Damages*

- A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

- A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

18.07 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

## **DOCUMENT 00 80 00**

### **SUPPLEMENTARY CONDITIONS**

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract (No. EJCDC C-700, 2013 Edition) and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

#### **ARTICLE 1 – DEFINITIONS AND TERMINOLOGY**

The terms used in these supplementary conditions which are defined in the standard general conditions of the construction contract (EJCDC C-700, 2013 edition) have the meanings assigned to them in the general conditions.

#### **ARTICLE 2 – PRELIMINARY MATTERS**

SC-2.01 Delete Paragraphs 2.01 B. and C. in their entirety and insert the following in their place:

- B. Evidence of Contractor's Insurance: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner copies of the policies of insurance (including all endorsements, and identification of applicable self-insured retentions and deductibles) required to be provided by Contractor in Article 6. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- C. Evidence of Owner's Insurance: After receipt from Contractor of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor copies of the policies of insurance to be provided by Owner under Article 6 (if any). Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

SC-2.02.A. Amend the first sentence of Paragraph 2.02.A. to read as follows:

Owner shall furnish to Contractor up to 5 copies of the Contract Documents which may include bound reduced drawings. Additional quantities of the Contract Documents will be furnished at reproduction cost.

#### **ARTICLE 3 – DOCUMENTS INTENT, REQUIREMENTS, REUSE**

Add the following new paragraph immediately after paragraph 3.03.B:

- C. In the event of an inconsistency between provisions in any of the contract documents, the order of precedence shall be established by the most stringent of the criteria and conditions.

#### **ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK**

SC-4.01.A Delete paragraph 4.01.A of the General Conditions and insert the following in its place:

- A. The Contract Times will commence to run on the day indicated in the Notice to Proceed. Any Work undertaken by CONTRACTOR prior to the date indicated in the Notice to Proceed will be entirely at his own risk

## **ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS**

SC-5.03 No Geotechnical Reports are known to Owner

SC 5.06 Delete Paragraphs 5.06.A and 5.06.B in their entirety and insert the following:

- A. No reports or drawings related to Hazardous Environmental Conditions at the Site are known to Owner.
- B. Not Used.

## **ARTICLE 6 – BONDS AND INSURANCE**

SC 6.03 Add the following new paragraph immediately after Paragraph 6.03.J:

- K. Contractor shall provide the following minimum insurance coverage with insurers admitted in the State of Utah with a Bests' rating of no less than A-, IX, and in the limits as listed in this document, unless approved by the Director of Risk Management and written for not less than the following, or greater if required by law and all such insurance to be primary to any insurance maintained by Owner, shall name Owner as additional insured with waiver of subrogation:
  - 1. WORKERS' COMPENSATION and EMPLOYERS LIABILITY: Workers' compensation statutory limits, as required by the Workers Compensation Act of the State of Utah, and Employers Liability limits set at a minimum of \$300,000 for each accident, disease, and employee. No officer or owner of any business or organization subject to the Workers' Compensation Act of the State of Utah may be excluded from this requirement.
  - 2. AUTOMOBILE LIABILITY: \$1,000,000 combined single limit "per accident" for bodily injury and property damage. "Any Auto" coverage is required.
  - 3. GENERAL LIABILITY: \$1,000,000 combined single limit per occurrence, personal injury and property damage. 2,000,000 aggregate. Broad Form Commercial General Liability is required (ISO 1993 or better). Completed Operations insurance must be kept in effect for 2 years after completion of work.
  - 4. The Contractor shall not commence Work under this Agreement until all of the insurance required herein shall have been obtained by the Contractor. The Contractor shall furnish to the Owner Certificates of Insurance verifying that such insurance has been obtained. Such certificates will provide that Owner will receive at least thirty (30) days prior written notice of any material change in, cancellation of, or non-renewal of such insurance.
  - 5. If applicable, professional liability (errors & omissions) Insurance coverage for a limit of \$2,000,000. Insurance shall be carried for two years after the work has been completed.
  - 6. EMPLOYMENT PRACTICES LIABILITY: \$1,000,000 per occurrence, \$1,000,000 aggregate. Required for employers subject to the provisions of Title VII of the Civil Rights Act and the Utah Antidiscrimination Act.
  - 7. If Contractor uses any subcontractors, Contractor will provide for subcontractors or require the same insurance provisions for its subcontractors.
  - 8. The Contractor shall warranty all work for one year according to the provisions included within Article 15.08 of the General Conditions.

9. Any deductibles or self-insured retention exceeding 5% of the limit of the policy must be declared to and approved by the City. At the option of the City, the insurer may be required to either: reduce or eliminate such deductibles or self-insured retention with respect to the City, its officers, officials, and employees; or the contracting party may be required to procure a bond guaranteeing payment of losses and related investigations, claim distributions, and defense expenses.
10. The contracting party shall disclose to the City all incidents or occurrences of accident, injury, and property damage within 24 hours of occurrence.
11. The policies are to contain, or to be endorsed to contain, the following provisions:
  - a. General Liability and Automobile Liability Coverages
    - i. The City and its officers, officials, employees, and volunteers are to be covered as an additional insured with respect to liability arising out of activities performed by or on behalf of the contracting party; products and completed or ongoing operations of the contracting party; premises owned, leased, hired, or borrowed by the contracting party. The coverage shall contain no limitations on the scope of protection afforded to the City and its officers, officials, employees, or volunteers.
    - ii. The contracting party's insurance coverage shall be a primary insurance. Any insurance or self-insurance maintained by the City, its officers, officials, employees, or volunteers shall be in excess of the contracting party's insurance and shall not reduce the contracting party's obligations in this policy.
    - iii. Any failure to comply with any reporting provision of the any policy shall not affect coverage provided to the City and its officers, officials, employees, or volunteers.
    - iv. The contracting party's insurance shall apply separately to each insured against whom a claim is made or suit is brought, except with respect to the limits of the insurer's liability.
    - v. All property damage liability insurance must include coverage for damages to premises rented. This provision may not be excluded by endorsement or omission from the commercial general liability coverage.
  - b. Workers' Compensation and General Liability Coverage
    - i. The insurer shall agree to waive all rights of subrogation against the City and its officers, officials, employees, and volunteers for losses arising from work performed by the contracting party for the City, and for any loss falling under general liability insurance coverage.
  - c. All Coverage
    - i. Each insurance policy required by this clause shall be endorsed to state that coverage shall not be suspended, voided, canceled by either party, reduced in coverage or in limits except after thirty (30) days' prior written notice by certified mail, return receipt requested, has been given to the City .

d. Waivers of Insurance

- i. A waiver of automobile insurance may be granted by the City if the party seeking a waiver certifies to the City that it does not intend to use an automobile or any other motorized vehicle in the course of its business or within the City limits.
- ii. A waiver of workers' compensation insurance may be granted by the City if the party seeking a waiver certifies to the City that it is a sole proprietor or is an organization with no employees. All such waivers are conditioned on compliance with the requirements to obtain a workers' compensation waiver found in the Workers' Compensation Act.

e. Special Coverages

- i. The City may require special coverages in addition to the coverages listed in this policy for certain types of contractors, providers of certain services, or the issuance of certain permits. The limits for special coverages shall be determined through consideration of the hazardousness of the work or project, the proximity of the project to the public, and the duration of the work or project. Special coverage(s), if required, may not be excluded from the insured party's policy by endorsement. Special coverages which the City may require include:
  - a. Abuse and molestation coverage;
  - b. Advertising injury coverage;
  - c. Aircraft liability coverage;
  - d. Asbestos abatement liability coverage;
  - e. Boiler and machinery liability coverage;
  - f. Builder's risk coverage;
  - g. Course of construction coverage;
  - h. Environmental coverage;
  - i. Excess liability coverage;
  - j. Explosion, collapse, underground (XCU) coverage;
  - k. Garagekeeper's coverage;
  - l. Liquor liability coverage;
  - m. Medical malpractice coverage;
  - n. On-hook liability coverage;
  - o. Pollution liability coverage;
  - p. Railroad protective liability coverage;
  - q. Watercraft liability coverage

f. Claims-made Policies

- i. With the exception of policies for professional liability, including errors and omissions, environmental liability, and employment

liability, claims-made policies will not be accepted by the City as adequate insurance coverage.

g. Evaluation of Loss History

- i. The City reserves the right to adjust all liability limits based on a pre-contract evaluation of a party's loss history. The City shall give fair notice of any adjustment of liability limits. In order to properly and fairly evaluate the risk of loss, the City shall require that all contract and permit applicants submit detailed plans for the contract or permit applied for, as well as a loss history conducted by a credible third party.

h. Care, Custody, or Control Exclusions

- i. If a contracting party's business requires the exercise of care, custody, or control over City property or public property within the limits of the City, and the party's general liability coverage includes a care, custody, or control exclusion, that party must also possess supplementary insurance which covers the City or public property within the insured party's care, custody, or control.

i. Other Laws

- i. All contracting parties shall obey all federal, state, county, and municipal laws, ordinances, regulations, and rules applicable to their operations and required insurance. Failure to do so shall result in the contracting party holding the City harmless from any liability arising out of or in connection with said violations. This shall include any attorney's fees and costs incurred by the City in connection with a violation of any federal, state, county, or municipal law, ordinance, or regulation by a contracting party.

SC-6.05. Add the following to the list of requirements in Paragraph 6.05.A, as a numbered item:

13. Include by express endorsement coverage of damage to Contractor's equipment.

## **ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES**

SC-7.02.B. Amend the first and second sentences of Paragraph 7.02.B to state "...all Work at the Site shall be performed during regular working hours, Monday through Friday. Contractor shall not perform Work on a Saturday, Sunday, or any legal holiday without written authorization from the Owner."

SC-7.02.C. Add the following new paragraph immediately after Paragraph 7.02.B:

Contractor shall be responsible for the cost of any overtime pay or other expense incurred by the Owner for Engineer's services (including those of the Resident Project Representative, if any), Owner's representative, and construction observation services, occasioned by the performance of Work on Saturday, Sunday, any legal holiday, or as overtime on any regular work day. If Contractor is responsible but does not pay, or if the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under Article 15.



SC-7.02.C. Add the following new subparagraph immediately after Paragraph 7.02.C:

1. For purposes of administering the foregoing requirement, additional overtime costs are defined as any hours over 8 hours on any regular work day and any hours worked on Saturday, Sunday, and any legal holiday.

SC-7.12.H. Add a new paragraph immediately after paragraph 7.12 G. of the General Conditions which is to read as follows:

- H. Protection of Person and Property: CONTRACTOR is solely responsible for safety measures in connection with the Project. CONTRACTOR shall take appropriate measures to prevent damage, injury or loss to: (1) all persons on the site or who may be affected by the Project; (2) all labor, materials and equipment to be incorporated into the Project; (3) other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities and underground facilities. CONTRACTOR shall comply with all applicable laws and regulations relating to the safety and protection of persons or property. CONTRACTOR shall erect and maintain all necessary safeguards for such safety and protection. If CONTRACTOR must enter a confined space, it shall have all personnel and monitoring equipment on site to necessary to comply with all OSHA and Owner's safety guidelines. A Confined Space Entry Permit shall be properly completed before entering a confined space. CONTRACTOR shall be responsible to erect and maintain all necessary traffic barricades and to provide all necessary traffic control. CONTRACTOR shall notify owners of adjacent property, including Blue Stakes notification to underground utility owners and shall cooperate with them in the protection, removal, relocation or replacement of their property. Any damage, injury or loss to any property caused, directly or indirectly, in whole or in part, by CONTRACTOR, any subcontractor, supplier, individual or entity performing the Project, shall be remedied by CONTRACTOR.

SC-7.18.D. Add a new paragraph immediately after paragraph 7.18 C. of the General Conditions which is to read as follows:

- D. To the fullest extent permitted by law, CONTRACTOR agrees to indemnify and hold harmless Owner from and against all claims, costs, losses and damages, including attorney fees, arising out of the performance of this Agreement, provided that any such claim, cost, loss, or damage: (1) is attributable to bodily injury, sickness, disease, death, injury to tangible property, loss of use of property, including interruption of business; and (2) is caused in whole or in part by any negligent act or omission of CONTRACTOR, any subcontractor or supplier for whom CONTRACTOR is responsible, regardless of whether caused in part by any negligent act or omission of Owner.

## **ARTICLE 8 – OTHER WORK AT THE SITE**

Add a new paragraph immediately after paragraph 7.02 of the General Conditions which is to read as follows:

- C. Should CONTRACTOR cause damage to the work or property of any separate contractor at the site, or should any claim arising out of CONTRACTOR's performance of the Work at the site be made by any separate contractor against CONTRACTOR, OWNER, ENGINEER, ENGINEER's Consultants, the Construction Coordinator or any other person, CONTRACTOR shall promptly attempt to settle

with such other contractor by agreement, or otherwise resolve the dispute by arbitration or at law. CONTRACTOR shall, to the fullest extent permitted by Laws and Regulations, indemnify and hold OWNER, ENGINEER, ENGINEER's Consultants and the Construction Coordinator harmless from and against all claims, damages, losses and expenses (including, but not limited to, fees of engineers, architects, attorneys and other professionals and court and arbitration costs) arising directly, indirectly or consequentially out of any action, legal or equitable, brought by any separate contractor against OWNER, ENGINEER, ENGINEER's Consultants or the Construction Coordinator to the extent based on a claim arising out of CONTRACTOR's performance of the Work. Should a separate contractor cause damage to the Work or property of CONTRACTOR or should the performance of Work by any separate contractor at the site give rise to any other claim, CONTRACTOR shall not institute any action, legal or equitable, against OWNER, ENGINEER, ENGINEER's Consultants or the Construction Coordinator or permit any action against any of them to be maintained and continued in its name or for its benefit in any court or before any arbiter which seeks to impose liability on or to recover damages from OWNER, ENGINEER, ENGINEER's Consultants or the Construction Coordinator on account of any such damage or claim. If CONTRACTOR is delayed at any time in performing or furnishing Work by any act or neglect of a separate contractor and OWNER and CONTRACTOR are unable to agree as to the extent of any adjustment in Contract Times attributable thereto, CONTRACTOR may make a claim for an extension of times in accordance with Article 11. An extension of the Contract Times shall be CONTRACTOR's exclusive remedy with respect to OWNER, ENGINEER, ENGINEER's Consultants and Construction Coordinator for any delay, disruption, interference or hinderance caused by any separate contractor. This paragraph does not prevent recovery from OWNER, ENGINEER, ENGINEER's Consultant or Construction Coordinator for activities that are their respective responsibilities.

## **ARTICLE 10 – ENGINEER’S STATUS DURING CONSTRUCTION**

### **SC-10.03 Project Representative**

Add the following new paragraphs immediately after Paragraph 10.03.A:

- B. The Resident Project Representative (RPR) will be Engineer's representative at the Site, will act as directed by and under the supervision of Engineer, and will confer with Engineer regarding RPR's actions.
  - 1. General: RPR's dealings in matters pertaining to the Work in general shall be with Engineer and Contractor. RPR's dealings with Subcontractors shall only be through or with the full knowledge and approval of Contractor. RPR shall generally communicate with Owner only with the knowledge of and under the direction of Engineer.
  - 2. Schedules: Review the progress schedule, schedule of Shop Drawing and Sample submittals, and Schedule of Values prepared by Contractor and consult with Engineer concerning acceptability.
  - 3. Conferences and Meetings: Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings, and prepare and circulate copies of minutes thereof.

4. Liaison:
  - a. Serve as Engineer's liaison with Contractor. Working principally through Contractor's authorized representative or designee, assist in providing information regarding the provisions and intent of the Contract Documents.
  - b. Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-Site operations.
  - c. Assist in obtaining from Owner additional details or information, when required for proper execution of the Work.
5. Interpretation of Contract Documents: Report to Engineer when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued by Engineer.
6. Shop Drawings and Samples:
  - a. Record date of receipt of Samples and Contractor-approved Shop Drawings.
  - b. Receive Samples which are furnished at the Site by Contractor, and notify Engineer of availability of Samples for examination.
  - c. Advise Engineer and Contractor of the commencement of any portion of the Work requiring a Shop Drawing or Sample submittal for which RPR believes that the submittal has not been approved by Engineer.
7. Modifications: Consider and evaluate Contractor's suggestions for modifications in Drawings or Specifications and report such suggestions, together with RPR's recommendations, if any, to Engineer. Transmit to Contractor in writing decisions as issued by Engineer.
8. Review of Work and Rejection of Defective Work:
  - a. Conduct on-Site observations of Contractor's work in progress to assist Engineer in determining if the Work is in general proceeding in accordance with the Contract Documents.
  - b. Report to Engineer whenever RPR believes that any part of Contractor's work in progress is defective, will not produce a completed Project that conforms generally to the Contract Documents, or will imperil the integrity of the design concept of the completed Project as a functioning whole as indicated in the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise Engineer of that part of work in progress that RPR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.
9. Inspections, Tests, and System Start-ups:
  - a. Verify that tests, equipment, and systems start-ups and operating and maintenance training are conducted in the presence of appropriate Owner's personnel, and that Contractor maintains adequate records thereof.
  - b. Observe, record, and report to Engineer appropriate details relative to the test procedures and systems start-ups.

10. Records:

- a. Prepare a daily report or keep a diary or log book, recording Contractor's hours on the Site, Subcontractors present at the Site, weather conditions, data relative to questions of Change Orders, Field Orders, Work Change Directives, or changed conditions, Site visitors, deliveries of equipment or materials, daily activities, decisions, observations in general, and specific observations in more detail as in the case of observing test procedures; and send copies to Engineer.
- b. Record names, addresses, fax numbers, e-mail addresses, web site locations, and telephone numbers of all Contractors, Subcontractors, and major Suppliers of materials and equipment.
- c. Maintain records for use in preparing Project documentation.

11. Reports:

- a. Furnish to Engineer periodic reports as required of progress of the Work and of Contractor's compliance with the Progress Schedule and schedule of Shop Drawing and Sample submittals.
- b. Draft and recommend to Engineer proposed Change Orders, Work Change Directives, and Field Orders. Obtain backup material from Contractor.
- c. Immediately notify Engineer of the occurrence of any Site accidents, emergencies, acts of God endangering the Work, force majeure or delay events, damage to property by fire or other causes, or the discovery of any Constituent of Concern or Hazardous Environmental Condition.

12. Payment Requests: Review applications for payment with Contractor for compliance with the established procedure for their submission and forward with recommendations to Engineer, noting particularly the relationship of the payment requested to the Schedule of Values, Work completed, and materials and equipment delivered at the Site but not incorporated in the Work.

13. Certificates, Operation and Maintenance Manuals: During the course of the Work, verify that materials and equipment certificates, operation and maintenance manuals and other data required by the Contract Documents to be assembled and furnished by Contractor are applicable to the items actually installed and in accordance with the Contract Documents, and have these documents delivered to Engineer for review and forwarding to Owner prior to payment for that part of the Work.

14. Completion:

- a. Participate in Engineer's visits to the Site to determine Substantial Completion, assist in the determination of Substantial Completion and the preparation of a punch list of items to be completed or corrected.
- b. Participate in Engineer's final visit to the Site to determine completion of the Work, in the company of Owner and Contractor, and prepare a final punch list of items to be completed and deficiencies to be remedied.
- c. Observe whether all items on the final list have been completed or corrected and make recommendations to Engineer concerning acceptance and issuance of the notice of acceptability of the work.

C. The RPR shall not:

1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including "or-equal" items).
2. Exceed limitations of Engineer's authority as set forth in the Contract Documents.
3. Undertake any of the responsibilities of Contractor, Subcontractors, or Suppliers.
4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of Contractor's work.
5. Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.
6. Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.
7. Accept Shop Drawing or Sample submittals from anyone other than Contractor.
8. Authorize Owner to occupy the Project in whole or in part.

**ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK**

SC 13.01.B.5.c Delete Paragraph 13.01.B.5.c in its entirety and insert the following in its place:

c. Construction Equipment and Machinery:

- 1) Rentals of all construction equipment and machinery, and the parts thereof, in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
- 2) Costs for equipment and machinery owned by Contractor will be paid at a rate shown for such equipment in the Rental Rate Blue Book. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs. Costs will include the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, shall cease to accrue when the use thereof is no longer necessary for the changed Work. Equipment or machinery with a value of less than \$1,000 will be considered small tools.

SC 13.03.E Delete Paragraph 13.03.E in its entirety and insert the following in its place:

- E. The unit price of an item of Unit Price Work shall be subject to reevaluation and adjustment under the following conditions:
1. if the extended price of a particular item of Unit Price Work amounts to 25 percent or more of the Contract Price (based on estimated quantities at the time of Contract formation) and the variation in the quantity of that particular item of Unit Price Work actually furnished or performed by Contractor differs by more than 25 percent from the estimated quantity of such item indicated in the Agreement; and

2. if there is no corresponding adjustment with respect to any other item of Work; and
3. if Contractor believes that Contractor has incurred additional expense as a result thereof, Contractor may submit a Change Proposal, or if Owner believes that the quantity variation entitles Owner to an adjustment in the unit price, Owner may make a Claim, seeking an adjustment in the Contract Price.

## **ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD**

SC 15.01.B.1 The first sentence of paragraph 15.01.B.1 of the general conditions is hereby deleted in its entirety and the following is substituted in lieu thereof:

1. At least thirty (30) days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. SC 15.01.D.1 The first sentence of paragraph 15.01.D.1 of the general conditions is hereby deleted in its entirety and the following is substituted in lieu thereof:

SC 15.03.B Add the following new subparagraph to Paragraph 15.03.B:

1. If some or all of the Work has been determined not to be at a point of Substantial Completion and will require re-inspection or re-testing by Engineer, the cost of such re-inspection or re-testing, including the cost of time, travel and living expenses, shall be paid by Contractor to Owner. If Contractor does not pay, or the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under Article 15.

SC15.01.D.1. The first sentence of paragraph 15.01.D.1 of the general conditions is hereby deleted in its entirety and the following is substituted in lieu thereof:

1. Twenty days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

SC 15.03.B Add the following new subparagraph to Paragraph 15.03.B:

1. If some or all of the Work has been determined not to be at a point of Substantial Completion and will require re-inspection or re-testing by Engineer, the cost of such re-inspection or re-testing, including the cost of time, travel and living expenses, shall be paid by Contractor to Owner. If Contractor does not pay, or the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under Article 15.

## **ARTICLE 17 – FINAL RESOLUTION OF DISPUTES**

SC-17.02 Add the following new paragraph immediately after Paragraph 17.01.

SC-17.02 Arbitration

- A. All matters subject to final resolution under this Article will be decided by arbitration in accordance with the rules of the State of Utah, subject to the conditions and limitations of this paragraph. This agreement to arbitrate and any other agreement

or consent to arbitrate entered into will be specifically enforceable under the prevailing law of any court having jurisdiction.

- B. The demand for arbitration will be filed in writing with the other party to the Contract and with the selected arbitrator or arbitration provider, and a copy will be sent to Engineer for information. The demand for arbitration will be made within the specific time required in this Article, or if no specified time is applicable within a reasonable time after the matter in question has arisen, and in no event shall any such demand be made after the date when institution of legal or equitable proceedings based on such matter in question would be barred by the applicable statute of limitations. The demand for arbitration should include specific reference to Paragraph SC-17.02.D below.
- C. No arbitration arising out of or relating to the Contract shall include by consolidation, joinder, or in any other manner any other individual or entity (including Engineer, and Engineer's consultants and the officers, directors, partners, agents, employees or consultants of any of them) who is not a party to this Contract unless:
  - 1. the inclusion of such other individual or entity is necessary if complete relief is to be afforded among those who are already parties to the arbitration; and
  - 2. such other individual or entity is substantially involved in a question of law or fact which is common to those who are already parties to the arbitration and which will arise in such proceedings.
- D. The award rendered by the arbitrator(s) shall be consistent with the agreement of the parties, in writing, and include a concise breakdown of the award, and a written explanation of the award specifically citing the Contract provisions deemed applicable and relied on in making the award.
- E. The award will be final. Judgment may be entered upon it in any court having jurisdiction thereof, and it will not be subject to modification or appeal, subject to provisions of the Laws and Regulations relating to vacating or modifying an arbitral award.
- F. The fees and expenses of the arbitrators and any arbitration service shall be shared equally by Owner and Contractor.

SC-17.03 Attorneys' Fees: For any matter subject to final resolution under this Article, the prevailing party shall be entitled to an award of its attorneys' fees incurred in the final resolution proceedings, in an equitable amount to be determined in the discretion of the court, arbitrator, arbitration panel, or other arbiter of the matter subject to final resolution, taking into account the parties' initial demand or defense positions in comparison with the final result.

- END OF DOCUMENT -

**DIVISION 01**

**GENERAL REQUIREMENTS**



**SECTION 01 11 00**  
**SUMMARY OF WORK**

**PART 1 GENERAL**

**1.01 PROJECT**

- A. Project Name: "CITYWIDE ROADWAY IMPROVEMENT PROJECT -- PROJECT # 004-21"
- B. Project Scope: The Project consists of the items of Work listed in Section 02100 - Measurement and Payment.
- C. Owner's Name: City of Cottonwood Heights, Utah.
  - 1. City Engineer: Matthew F. Shipp, P.E.
- D. Design Engineer's Name: Adam Ginsberg
- E. The Project shall be constructed according to these project specifications and drawings; and according to the Standard Technical Specifications and APWA Latest Edition
  - 1. Work on this project shall be done as specified in these project specifications and as indicated on the project drawings.
  - 2. All work not covered by these specifications shall be done as specified by APWA.

**1.02 CONTRACT DESCRIPTION**

- A. Contract Type: A single prime contract based on a Stipulated Price as described in Agreement.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**

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## SECTION 01 24 00 VALUE ANALYSIS

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### PART 1 GENERAL

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#### 1.1 SECTION INCLUDES

- A. Procedure for evaluating alternate or substitute proposals for materials or equipment for the purpose of the betterment of the Work or reducing the Cost of the Work.
- B. Each proposal will be compared for Effective Cost.

#### 1.2 VALUE ENGINEERING - MEASUREMENT AND PAYMENT

- A. If a cost reduction proposal is accepted in whole or in part, OWNER will pay 50 percent of the net savings and the cost of developing the proposal minus 50 percent of ENGINEER's cost of investigating a cost reduction proposal.
- B. In determining the estimated net savings, the right is reserved to disregard the Contract Bid prices.
- C. Payment constitutes the full reimbursement for any cost reduction proposal. OWNER may use the proposal in future work as it deems needful.

#### 1.3 DEFINITIONS

- A. **Design Life:** The time life span of the product used in the Work established by ENGINEER.
- B. **Effective Cost:** Total cost of material or equipment in today's dollars. The cost includes First Cost, any Replacement Costs during the Design Life, and any residual value at the end of the Design Life. Three possible cases exist for determining effective cost:
  - 1. Case 1 - Service Life equals Design Life.
  - 2. Case 2 - Service Life is less than Design Life.
  - 3. Case 3 - Service Life is greater than Design Life.
- C. **First Cost:** The bid price for an alternate material or equipment and installation. Historical data may be used to determine an appropriate value for pre-Bid evaluations.
- D. **Replacement Cost:** The cost in today's dollars to replace material or equipment.
- E. **Service Life:** The time life span of material or equipment before Failure occurs or before cost of maintenance justifies replacement. Service life shall be established by ENGINEER.

## 1.4 SUBMITTALS

- A. At any time after award of Contract, CONTRACTOR may submit written proposals for modifying the Contract Documents.

## 1.5 EVALUATION OF PROPOSALS

- A. Compute each proposal's least cost using the appropriate steps in the following table. Rank the proposals in order of lowest Effective Cost.

| Table 1 – Least Cost Analysis   |          |       |       |       |       |                     |       |       |       |
|---|----------|-------|-------|-------|-------|---------------------|-------|-------|-------|
| Step  |          |       |       |       |       | Longest Lived First |       |       |       |
| 1. Project Design Life  |          |       |       |       |       |                     |       |       |       |
| 2. Assigned Service Life, n, years  |          |       |       |       |       |                     |       |       |       |
| 3. Lowest Responsive Bid, P, Each Alternate   |          |       |       |       |       |                     |       |       |       |
| 4. Total Replacement Cost =<br>$P \left[ 1 + \left( \frac{I+I}{I+i} \right)^n + \left( \frac{I+I}{I+i} \right)^{2n} + \dots + \left( \frac{I+I}{I+i} \right)^{mn} \right]$ Replacement Costs shall be calculated using a difference between interest and inflation.<br>Replacement Costs = 2 percent (i-I) unless specified otherwise |          |       |       |       |       |                     |       |       |       |
| 5. Present Value, Residual Amount =<br>$P \left( \frac{n_L - n_S}{n_L} \right) \left( \frac{I+I}{I+i} \right)^{n_S}$  |          |       |       |       |       |                     |       |       |       |
| 6. Effective Cost<br>Case 1: (Step 3), or<br>Case 2: (Step 3 + Step 4), or<br>Case 3: (Step 3 – Step 5)   |          |       |       |       |       |                     |       |       |       |
| $\left( \frac{I+I}{I+i} \right)^{n''}$  |          |       |       |       |       |                     |       |       |       |
| i-I<br>%  | n, years |       |       |       |       |                     |       |       |       |
|   | 20       | 25    | 30    | 40    | 50    | 60                  | 75    | 80    | 90    |
| 1.0   | 0.835    | 0.798 | 0.762 | 0.697 | 0.636 | 0.581               | 0.508 | 0.485 | 0.443 |
| 2.0   | 0.695    | 0.635 | 0.580 | 0.484 | 0.403 | 0.336               | 0.256 | 0.234 | 0.196 |
| 3.0   | 0.590    | 0.518 | 0.454 | 0.349 | 0.268 | 0.206               | 0.139 | 0.122 | 0.093 |
| 4.0   | 0.490    | 0.410 | 0.343 | 0.240 | 0.168 | 0.118               | 0.069 | 0.058 | 0.041 |
| 5.0   | 0.415    | 0.333 | 0.268 | 0.172 | 0.111 | 0.072               | 0.037 | 0.030 | 0.019 |
| Where<br>I = Inflation Rate<br>i = Interest Rate<br>m = Total number of material or equipment replacements<br>n = Assigned Service Life, years<br>n <sub>L</sub> = Service Life longer lived alternate, years<br>n <sub>S</sub> = Service Life shorter lived alternate, years<br>P = Lowest responsive Bid, each alternate            |          |       |       |       |       |                     |       |       |       |

- B. ENGINEER will announce as soon as possible the Effective Cost ranking of the most responsible cost proposal.
- C. Should a Service Life longer than that assigned be included in a cost

reduction proposal, written documentation supporting the proposed Service Life must be submitted to the ENGINEER. The documentation must be in a form satisfactory to the ENGINEER. ENGINEER is not obliged to accept the proposed Service Life, but may elect to use the announced Service Life.

1.6 ACCEPTANCE

- A. ENGINEER shall be sole judge of the acceptance of a cost reduction proposal.
- B. ENGINEER may accept wholly or in part or reject the proposal, as judgment deems correct.
- C. OWNER and ENGINEER are not liable for failure to accept or act upon any cost reduction proposal.

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|---------------------------|----------|
| <b>PART 2    PRODUCTS</b> | Not Used |
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|----------------------------|----------|
| <b>PART 3    EXECUTION</b> | Not Used |
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END OF SECTION



**SECTION 01 25 00**  
**PRODUCT OPTIONS AND SUBSTITUTIONS**

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**PART 1 GENERAL**

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**1.1 SECTION INCLUDES**

- A. Administrative and procedural requirements for selection of product and the substitution of product.
- B. Substitution of product occurs after the Effective Date of the Construction Contract. Before Effective Date, OWNER only considers options for selecting alternate products.

**1.2 DEFINITIONS**

- A. **Options:** The choices that the CONTRACTOR has in selecting products after award of the Contract. The conditions and choices are as follows:
  - 1. Products Specified by Reference Standards or by Description Only: Any product meeting the reference standard or description.
  - 2. Products Specified by Naming One or More Manufacturers: No options or Substitutions.
  - 3. Products Specified by Naming a Manufacturer with an “or equal” Phrase: Any manufacturer not specifically named will be allowed after approval by ENGINEER.
- B. **Substitutions:** Changes requested by CONTRACTOR after award of the Contract which affects products, materials, equipment, and methods of construction required by Contract Documents. The following are NOT considered substitutions:
  - 1. Revisions to Bid Documents requested by Bidders during the bidding period, and accepted before award of contract, are considered as included in the Contract Documents and are not subject to requirements specified in this section for substitutions.
  - 2. Revisions to Contract Documents requested at any time by OWNER or ENGINEER.
  - 3. Specified Options of products and construction methods included in Contract Documents.
  - 4. The CONTRACTOR's determination of and compliance with governing Laws and Regulations and orders issued by governing authorities.

**1.3 SUBMITTALS**

- A. After Notice of Intent to Award, submit four (4) copies of the list of product Options that are proposed. Include name of manufacturer.
- B. Tabulate products by specification section number, title, and article number.

- C. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.
- D. ENGINEER will reply in writing stating whether there is objection to listed items. Failure to object to a listed item shall not relieve CONTRACTOR from compliance with the requirements of the Contract Documents.

#### **1.4 LIMITATIONS ON SUBSTITUTIONS**

- A. Substitutions will not be considered when indicated on Shop Drawings or Product Data submittals without separate formal request, when requested directly by Subcontractor or Supplier, or when acceptance will require substantial revision of Contract Documents.
- B. Substitute products shall not be ordered or installed without written acceptance.
- C. ENGINEER to determine acceptability of Substitutions.

#### **1.5 REQUEST FOR SUBSTITUTIONS**

- A. Allow ENGINEER 10 days to evaluate Substitution requests.
- B. Submit separate request for each Substitution. Document each request with complete data substantiating compliance and compatibility of proposed Substitution with requirements of Contract Documents.
- C. Identify product by specification's section and article numbers. Provide manufacturer's name, address, phone number, trade name of product, and model or catalog number. List fabricators and Suppliers as appropriate.
- D. Attach product data as indicated in Section 01 33 00.
- E. Give itemized comparison of proposed Substitution with specified product, listing variations, and reference to specification's section and article numbers.
- F. Give quality and performance comparison between proposed Substitution and the specified product.
- G. Give cost data comparing proposed Substitution with specified product, and amount of net change to Contract Price.
- H. List availability of maintenance services and replacement materials.
- I. Indicate effect of Substitution on progress schedule, and change required in other work or products.

#### **1.6 CONTRACTOR REPRESENTATION**

- A. Request for Substitution constitutes a representation that CONTRACTOR:
  - 1. Has investigated proposed product and determined that it is equal to or superior in all respects to specified product.
  - 2. Shall provide same warranty for Substitution as for specified product unless warranty for substituted product is larger.
  - 3. Shall coordinate installation of accepted substitute, making such changes as may be required for Work to be complete in all respects.
  - 4. Certifies that cost data presented is complete and includes all related

costs.

- 5. Waives claims for additional costs related to Substitution that may later become apparent

1.7 SUBMITTAL PROCEDURES

- A. After the Effective Date of the Construction Contract, submit copies of each Substitution request in the form and per procedures required for Change Order proposals (refer to Section 01 26 00).
- B. For accepted products, submit Shop Drawings, product data, and Samples; Section 01 33 00.

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| <b>PART 2    PRODUCTS</b> | Not Used |
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| <b>PART 3    EXECUTION</b> | Not Used |
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END OF SECTION





## SECTION 01 26 00

# CONTRACT MODIFICATION PROCEDURES

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### PART 1 GENERAL

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#### 1.1 SECTION INCLUDES

- A. Procedures for initiating and authorizing contemplated changes to the Work.

#### 1.2 DEFINITIONS

- A. **Request for Proposal (RFP):** Written or verbal inquiry by ENGINEER to the CONTRACTOR that asks for information pertinent to OWNER's contemplated changes to the Work.
- B. **Request for Change (RFC):** Written or verbal inquiry by the CONTRACTOR to the ENGINEER that asks for changes to the Work.

#### 1.3 PRELIMINARY PROCEDURES

- A. **Changes Proposed by ENGINEER:** ENGINEER may initiate changes by issuing a Request for Proposal (RFP) to CONTRACTOR. Such request is for information only, and is not an instruction to execute the changes, or to stop work in progress. The request will include:
  - 1. A specific statement from the CONTRACTOR advising the ENGINEER whether or not the proposed change affects the Progress Schedule's critical path.
  - 2. Description of the proposed change, products required in the change, and location of the change in the Project.
  - 3. Supplementary or revised Drawings and Specifications.
  - 4. The projected time span for making the change, and a specific statement as to whether overtime work is, or is not, authorized.
  - 5. A specific period of time during which the requested price will be considered valid.
- B. **Changes Proposed by CONTRACTOR:** CONTRACTOR may propose changes by submitting a written Request for Change (RFC) to the ENGINEER, containing:
  - 1. A specific statement of the effect that the contemplated change has on the Progress Schedule's critical path.
  - 2. Description of the proposed change.
  - 3. Statement of the reason for making the changes.
  - 4. Statement of the effect on the work of separate contractors.
  - 5. Documentation supporting any change in the Contract Price or Contract Time as appropriate.
  - 6. Documentation of any Substitutions per Section 01 25 00.

- C. **Work Directive Change:** Instead of a Request for Proposal (RFP), ENGINEER may issue a Work Directive Change for CONTRACTOR to proceed with work which will be included in a subsequent Change Order.
1. The Work Directive Change will describe changes in the Work, both additions and deletions, with attachments of revised Contract Documents to define details of the change, and will designate the method of determining any change in the Contract Price and any change in Contract Time.
  2. CONTRACTOR may sign and date the Work Directive Change to indicate agreement with the terms therein.
  3. ENGINEER will sign and date the Work Directive Change as authorization for the CONTRACTOR to proceed with the changes.
- D. **Force Account:** When Contract Price or Contract Time cannot be determined before executing a Change Order for contemplated work:
1. ENGINEER will issue a Work Directive Change instructing the CONTRACTOR to proceed with the contemplated work.
  2. At completion of the contemplated work, CONTRACTOR shall submit itemized accounting and supporting data as provided in the General Conditions.
  3. ENGINEER will determine the allowable cost of such contemplated work, as provided in the General Conditions.
  4. CONTRACTOR signs and dates the Change Order to indicate agreement therewith.
  5. ENGINEER signs and dates the Change Order to establish the change in Contract Price and Contract Time.

#### 1.4 DOCUMENTATION REQUIRED FOR PROPOSALS OR CLAIMS

- A. Support each proposal or claim with sufficient substantiating data to allow ENGINEER to evaluate the quotation. Provide the following data.
1. Existing work affected (change to progress schedule).
  2. Labor required.
  3. Equipment required.
  4. Products required.
    - a. Recommended source of purchase and unit cost.
    - b. Quantities required.
  5. Taxes, insurance and bonds.
  6. Credit for work deleted from Contract, similarly documented.
  7. Overhead and profit.
  8. Justification for any change in Contract Time.
- B. Support each claim on a time and materials (force account) basis, with documentation as required for a lump-sum proposal, plus additional information:
1. Name of OWNER's authorized agent who ordered the work, and

date of the order.

2. Dates and times work was performed, and by whom.
3. Time record, summary of hours worked, and hourly rates paid.
4. Receipts and invoices for:
  - a. Equipment used, listing dates and time of use.
  - b. Products used, listing of quantities.
  - c. Subcontracts.
- C. Document requests for Substitutions for products as specified in Section 01 25 00.

#### **1.5 PREPARATION OF CHANGE ORDER**

- A. ENGINEER will prepare the Change Orders.
- B. The Change Order will describe changes in the Work, both additions and deletions, with attachments of revised Contract Documents to define details of the change.
- C. The Change Order will provide an accounting of the adjustment in the Contract Price and the Contract Time.
- D. Several Request for Proposal (RFP) and Request for Changes (RFC) may be included in one Change Order.

#### **1.6 LUMP SUM OR FIXED PRICE CHANGE ORDER**

- A. The content of a Change Order in a lump sum contract will be based on, either:
  1. ENGINEER's Request for Proposal (RFP) and CONTRACTOR's responsive proposal as mutually agreed between ENGINEER and CONTRACTOR; or
  2. CONTRACTOR's Request for Change (RFC), as recommended by ENGINEER to OWNER.
- B. CONTRACTOR may sign and date the Change Order to indicate agreement with the terms therein.
- C. ENGINEER will sign and date the Change Order as authorization for the CONTRACTOR to proceed with the contemplated work.

#### **1.7 UNIT PRICE CHANGE ORDER**

- A. Content of a unit price Change Order will be based on:
  1. ENGINEER's definition of the scope of the required changes;
  2. CONTRACTOR's proposal for a change, as recommended by ENGINEER; or
  3. Survey of completed work.
- B. The amounts of the unit prices to be:
  1. Those stated in the Agreement; or
  2. Those mutually agreed upon between ENGINEER and CONTRACTOR and accepted by the OWNER.

- C. When quantities of each of the items affected by the Change Order can be determined before start of the contemplated work:
  - 1. CONTRACTOR signs and dates the Change Order to indicate agreement with the quantities and terms therein.
  - 2. ENGINEER signs and dates the Change Order as authorization for CONTRACTOR to proceed with the contemplated work.
  - 3. CONTRACTOR completes contemplated work and is paid total amount indicated on the Change Order.
- D. When quantities of the items cannot be determined before start of the contemplated work:
  - 1. ENGINEER prepares Change Order using his best estimate of needed quantities.
  - 2. CONTRACTOR signs and dates Change Order to indicate agreement with the terms therein.
  - 3. ENGINEER signs and dates Change Order as authorization for CONTRACTOR to proceed with the contemplated work.
  - 4. CONTRACTOR completes contemplated work and is paid for work quantities completed.

1.8 CORRELATION WITH CONTRACTOR'S SUBMITTALS

- A. Periodically revise Schedule of Values and request for payment forms to record each change as a separate item of Work, and to record the adjusted Contract Price.
- B. Periodically revise the Progress Schedule to reflect each change in Contract Time. Revise sub-schedules to show changes for other items of work affected by the changes.
- C. Upon completion of Change Order work, enter pertinent changes in the Record Documents, Section 01 78 39.

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| <b>PART 2    PRODUCTS</b> | Not Used |
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| <b>PART 3    EXECUTION</b> | Not Used |
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END OF SECTION

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**SECTION 01 29 00**  
**PAYMENT PROCEDURES**

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**PART 1 GENERAL**

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**1.1 SECTION INCLUDES**

- A. Measurement and payment procedures, forms, submission requirements, and price adjustments.

**1.2 SUBMITTAL PROCEDURES**

- A. Submit at least two copies of each Application for Payment. Each application must be signed by CONTRACTOR.
- B. Submit an updated progress schedule with each Application for Payment.
- C. When ENGINEER requires substantiating information, submit data.

**1.3 UNIT PRICE PAY REQUEST FORMS**

- A. **Application Form:** ENGINEER prepared or one acceptable to the ENGINEER.
- B. **Schedule of Prices:** ENGINEER prepared or one acceptable to the ENGINEER.

**1.4 LUMP SUM PAY REQUEST FORMS**

- A. **Application Form:** Use AIA Form G702 - Application and Certificate for Payment; or AIA G722 - Project Application and Project Certificate for Payment; or EJCDC Form 1910-8-E - Application for Payment; or CONTRACTOR's standard form; or electronic media printout following one of the above standard forms.
- B. **Schedule of Values Form:** Use AIA Form G703 - Application and Certificate for Payment Continuation Sheet and AIA G723 - Project Application Summary, or EJCDC Form 1910-8-E, or CONTRACTOR's standard form, or electronic media printout following one of the above standard forms. Follow the outline presented in the Bid Form. For each item, provide a column (or row) for listing each of the following:
  - 1. Item number.
  - 2. Description of work.
  - 3. Scheduled values.
  - 4. Previous applications.
  - 5. Work in plan and stored materials under this application.
  - 6. Authorized Change Orders.
  - 7. Total completed and stored to date of application.
  - 8. Percentage of completion.
  - 9. Balance to finish.

10. Retainage.
11. Overhead and profit.

- C. **Submission Schedule:** Comply with time requirement of Paragraph 2.5B of the General Conditions when submitting the Schedule of Values (Within 10 Days after the Effective Date of the Construction Contract.)
- D. **Revisions:** Revise schedule of values to list approved Change Orders, with each Application for Payment.

## 1.5 MEASUREMENT

### A. **General:**

1. Measurement methods specified in individual Sections of the Standard Specifications are intended to compliment the criteria of this Section.
2. ENGINEER will take all measurements and compute all quantities.
3. CONTRACTOR will,
  - a. Furnish labor to assist ENGINEER in obtaining and handling test Samples at site or sources.
  - b. Provide all equipment, workers, and survey crews to assist ENGINEER in making measurements.
  - c. Verify ENGINEER's measurements and computations.

- B. **Unit of Measurement:** Refer to the Bid Form. It identifies the unit of measurement to be used for unit price items.

- C. **Weight Basis:** Measured by scale or by handbook weights for the type and quantity of material actually furnished and used.
  1. For material to be measured and paid for by weight, furnish accurate scales. Use platform scales of sufficient size and capacity to permit the entire vehicle or entire combination of vehicles to rest on the scale platform while being weighed. Combination vehicles may be weighed as separate units provided they are disconnected while being individually weighed. Pay for all costs incurred as a result of regulating, adjusting, testing, inspecting, and certifying scales.
  2. ENGINEER may be present to witness weighing and to check and compile daily records of such scale weights; however, in any case, furnish weigh slips and daily summary weigh sheets. Furnish duplicate weigh slip or a load slip to each vehicle weighed and deliver the slip to ENGINEER at the point of delivery of the material.
  3. If the material is shipped by rail, certified car weights will be accepted. Only actual weight of material will be paid for and not minimum car used for assessing freight tariff. Car weights will not be used for material to be passed through mixing plants.
  4. Trucks used to haul material shall be weighed empty daily and at such additional times as directed. Each truck shall bear a plainly legible identification mark. ENGINEER may require the weight of the material verified by weighing empty and loaded trucks on other scales.

- D. **Area Basis:** Measured by square dimension using mean length and width or radius.
- E. **Linear Basis:** Measured by linear dimension at the item centerline or mean chord.
- F. **Volume Basis:** Measured by cubic dimension using mean length, width and height or thickness.
  - 1. Volumes will be determined and based upon material compacted in-place (not loose measure as per delivery ticket).
  - 2. When it is impractical to determine the volume by rectilinear measurements in place or by the specified method of measurement, or when requested by the CONTRACTOR in writing and accepted in writing, the material will be weighed in accordance with the requirements specified for weight measurement. Such weights will be converted to volume measurement for payment purposes. Factors for conversion from weight measurement to volume measurement will be determined and shall be agreed to by CONTRACTOR before such method of measurement of pay quantities will be accepted.
- G. **Each Basis:** Measured by the unit.
- H. **Lump Sum Basis:** Measured on a percent complete basis.

#### 1.6 PAYMENT

- A. Payment covers all labor, products, tools, equipment, paint, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit.
- B. Quantities supplied or placed in the Work and measurements agreed to by CONTRACTOR determine payment.
- C. The final payment sum may be as great as twice the value of Punch List work or at least equal to the value of the work declared defective by the ENGINEER.

#### 1.7 INCIDENTAL WORK

- A. No separate measurement or payment for incidental work, (paragraph 3.1C of the General Conditions (Document 00 72 00)).

#### 1.8 PRODUCT

- A. No separate measurement and payment for:
  - 1. Product or work provided by ENGINEER or OWNER;
  - 2. Product wasted or disposed of in a manner that is not acceptable;
  - 3. Product determined as unacceptable before or after placement;
  - 4. Product not completely unloaded from the transporting vehicle;
  - 5. Product placed beyond the lines and levels of the required Work;
  - 6. Product remaining on hand after completion of the Work; or
  - 7. Loading, hauling and disposing of rejected product.

#### 1.9 MATERIALS AND EQUIPMENT ON-HAND

- A. CONTRACTOR may include in partial payment applications, an



advanced payment item for acceptable non-perishable products purchased or manufactured expressly for the Work, if:

1. Certified copies of product invoices are approved.
  2. The maximum sum to be included in partial payment applications does not exceed 75 percent of the value of the product shown on the invoice or 75 percent of the in place price, whichever sum is less.
  3. Product is stored in the vicinity of the Project or when the approved storage location is other than the site, evidence is furnished that the stored product is irrevocably obligated to the Work.
  4. CONTRACTOR is responsible for any damages, loss or theft of product until product is incorporated in the Work and accepted.
- B. Payment for materials shall not constitute acceptance of any materials which do not conform to the Contract Documents.
- C. No partial payment will be made on living, or perishable plant materials until planted.

#### 1.10 PRICE ADJUSTMENT

- A. **Defective Work or Non-complying Material:** If ENGINEER determines it is not practical to remove and replace Defective Work or non-complying material, any of the following remedies may be applied:
1. Defective Work or non-complying material may remain, but the price reduced up to 50 percent.
  2. If non-complying material has been installed and no price for the material is specified, apply price reduction against cost of work requiring complying material as part of its installation.
  3. Defective Work or non-complying material will be partially repaired and the price will be adjusted to a new price.
  4. Pay for Defective Work on a pay factor basis:
    - a. Where two (2) or more pay factors apply to one item of Defective Work or material (even if pay factors are determined using separate specification sections), the smallest pay factor shall be used to determine price adjustment.
    - b. Pay factors shall not be cumulative.
    - c. Pay factors shall be applied to unit prices in either the bid form or a Change Order.
- B. **Contract Price Adjustment:** In lump sum contracts, Contract Price adjustment shall be effected by Change Order. In unit price contracts, Contract Price adjustment shall be effected by adjusting unit quantities.
- C. **Early Completion:** No additional money will be due CONTRACTOR:
1. If CONTRACTOR completes Work or any portion of Work before Contract Time, or
  2. If early completion is delayed.

**PART 2    PRODUCTS**

Not Used

**PART 3    EXECUTION**

Not Used

END OF SECTION



## **SECTION 01 31 13 COORDINATION**

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### **PART 1 GENERAL**

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#### **1.1 SECTION INCLUDES**

- A. Coordination among CONTRACTOR's employees and Subcontractors, and any utility company, separate contractor, property owner, OWNER, and authority having jurisdiction.

#### **1.2 COORDINATING WITH ENGINEER**

- A. Cooperate with ENGINEER, inspectors, and separate contractors to establish on-site lines of authority for communication.
- B. Develop procedures for handling submittals, reports, records, recommendations, coordination drawings, and schedules.
- C. Notify in writing of problems that develop during construction.
- D. Ensure agency responsible for operation and maintenance of the completed facility is advised before a project or parts thereof are open for use.
- E. Maintain and operate the Work until accepted and turned over to the agency responsible for operation and maintenance.

#### **1.3 COORDINATING WITH PRIVATE AND PUBLIC AGENCIES**

- A. Notify private and public agencies affected by the proposed construction, coordinate required adjustments, and arrange for all necessary adjustments of utilities within or adjacent to the limits of construction.
- B. Obtain utility locations from the one call center (Blue Stake) or other utility coordination service two (2) to seven (7) working Days before any excavation. Locations must be updated every 14 Days.
- C. All utilities and utility appurtenances within the limits of the Work that are to be relocated or adjusted shall be moved by the affected utility company, unless specified otherwise.
- D. Notify police, fire and transit authority.

#### **1.4 COORDINATING WITH SEPARATE CONTRACTORS**

- A. Coordinate with separate contractors at no additional cost to OWNER to leave Work complete and finished.
- B. Inspect and promptly report any apparent discrepancies or defects in work done by separate contractors that render Work unsuitable for proper execution and results. Failure to inspect and report shall constitute acceptance of separate contractor's work as fit and proper to receive work of this contract, except as to defects that may develop in the other separate contractor's work after the execution of the CONTRACTOR's work.

**1.5 COORDINATING WITH ADJACENT PROPERTY OWNER**

- A. **Notice:** Notify property owner 10 Days before the start of construction and at least 48 hours in advance of the interruption of utility service or the interruption of access, or the installation of bituminous material.
- B. **Access:** Provide all weather access to property owner at all times, unless property owner or ENGINEER approve otherwise.
- C. **Easements:** Where work is on easements on private property, coordinate work with the property owner so that work will minimize inconvenience to property owner.
- D. **Refuse Collection:**
  - 1. Inform all affected property owners ahead of time by written notice of the place of deposit and time when their refuse will be collected.
  - 2. If necessary haul refuse to nearest point of suitable collection as determined by the refuse collection agency.
- E. **Mail:** Cooperate with the U.S. Postal Service in the delivery of mail.

**1.6 INTERRUPTION OF UTILITIES**

- A. Notify fire and police services in local jurisdiction if emergency is safety related or if construction activities interrupt any utility service.
- B. Contact the affected utility company. Find out how soon repairs can be made as well as when the repairs will begin.
- C. Contact the affected local residences or businesses. Inform when repairs will begin and how long it will take to complete them.
- D. Inform ENGINEER and OWNER.

**1.7 INTERRUPTION OF OWNER'S OPERATIONS**

- A. If any aspect of normal OWNER operations needs to be interrupted for completion of the Work, notify ENGINEER in writing.
- B. Submit notice with an alternate plan to cover contingency problems. In the alternate plan allow for maintenance of utilities or other essential services that must be interrupted for any period otherwise deemed necessary by OWNER to be unacceptable for necessary OWNER operations.
- C. Shutdown of utilities must be accomplished during approved hours at no additional cost to OWNER. If work requires a longer shutdown, it must then be accomplished during separate periods.
- D. Do not proceed with proposed shutdown without written approval.

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**PART 2 PRODUCTS**

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Not Used

**PART 3   EXECUTION**

Not Used

END OF SECTION



**SECTION 01 31 19**  
**PRECONSTRUCTION CONFERENCE**

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**PART 1 GENERAL**

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**1.1 SECTION INCLUDES**

- A. CONTRACTOR participation in preconstruction conference.

**1.2 PRECONSTRUCTION CONFERENCE**

- A. Before commencement of Work at site, a preconstruction conference will be held at a mutually agreed time and place attended by CONTRACTOR, its' superintendent, and its' Subcontractors as appropriate. Other attendees will be:
1. ENGINEER and Resident Project Representative.
  2. Representatives of OWNER.
  3. Representatives of affected utility companies.
  4. Governmental representatives as appropriate.
  5. Others as requested by CONTRACTOR, OWNER, or ENGINEER.
- B. Unless previously submitted, bring to the conference one copy of each of the following:
1. Progress schedule.
  2. Procurement schedule of major equipment and materials and items requiring long lead time.
  3. Schedule of submittals.
  4. Schedule of values (lump sum price breakdown) for progress payment purposes.
  5. Schedule of OWNER furnished items.
- C. The purpose of the conference is to designate responsible personnel and establish a working relationship. Matters requiring coordination will be discussed and procedures for handling such matters established. The complete agenda will be furnished to the CONTRACTOR before the meeting date, which may include the following:
1. CONTRACTOR's tentative schedules.
  2. Transmittal, review and distribution of CONTRACTOR's tentative schedules.
  3. Processing applications for payment.
  4. Maintaining Record Documents.
  5. Critical work sequencing.
  6. Field decisions and Change Orders.
  7. Use of Project site, office and storage areas, security, housekeeping, and OWNER's needs.



8. Major equipment deliveries and priorities.
  9. CONTRACTOR's assignments for safety and first aid.
- D. ENGINEER will preside at preconstruction conference and will arrange for recording and distributing minutes to all persons in attendance.

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**PART 2 PRODUCTS**

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Not Used

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**PART 3 EXECUTION**

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Not Used

END OF SECTION

SECTION 01 31 20  
PARTNERING

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PART 1 GENERAL

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1.1 SECTION INCLUDES

- A. Administrative guidelines for partnering.

1.2 PARTNERING INITIATIVE

- A. The OWNER desires to create a foundation for a voluntary partnership with the CONTRACTOR and the CONTRACTOR's Subcontractors and Suppliers. The partnership will be structured to draw on the strengths of the OWNER and the CONTRACTOR to achieve the following goals:
  - 1. To expedite the project in full compliance with the plans and specifications with all issues among the OWNER, the CONTRACTOR, the CONTRACTOR's sub-contractors, and interested outside agencies resolved in a timely manner at the appropriate decision making level.
  - 2. To mitigate to the fullest extent possible any disruptions to the CONTRACTOR's and OWNER's use of the facilities at the construction site;
  - 3. To emphasize value engineering and expedite submittal and review of all proposals;
  - 4. to foster atmospheres of trust and team work;
  - 5. To appreciate the fiscal objectives of all participants in the partnership; and
  - 6. To insure there are no unsettled issues at the completion of the work.
- B. This partnering initiative will not change the legal relationship of the parties to the Construction Contract or release nor relieve either party from any of the terms of the Construction Contract.

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PART 2 PRODUCTS

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Not Used

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PART 3 EXECUTION

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Not Used

END OF SECTION



**SECTION 01 32 16**  
**PROGRESS SCHEDULE**

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**PART 1 GENERAL**

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**1.1 SECTION INCLUDES**

- A. Progress schedule requirements.

**1.2 TYPE OF SCHEDULE**

- A. CONTRACTOR's choice.

**1.3 SUBMITTALS**

- A. **Before construction**, submit a preliminary progress schedule per paragraph 2.5B1 of the General Conditions (Document 00 72 00).
- B. **During construction** submit:
  - 1. Updated progress schedule on a monthly basis.
  - 2. A narrative report when the schedule does not reflect the Work process. Discuss recovery procedures shown in the schedule because of problem areas. Identify any costs to be paid by OWNER.
  - 3. Promptly deliver to ENGINEER a revised progress schedule if work cannot be completed per the current schedule.
- C. **At any time upon ENGINEER's request** and at no additional cost to the OWNER, submit a critical path schedule, in place of an activity bar chart (Gantt chart) schedule if work falls more than seven (7) Days behind schedule.

**1.4 BAR CHART SCHEDULE (GANTT CHART)**

- A. Plan and record construction of Project using a conventional activity schedule chart analysis system. Include activities of Subcontractors and Suppliers:
  - 1. Show complete sequence of construction activity networks as time scaled (squared) with starting time for all activities, in no less than weekly divisions from left to right, and with activities scheduled from **right to left**.
  - 2. Provide a minimum of **25 activities** showing construction prosecution or preparation activities. Unit price contracts with ten or fewer bid items shall have a minimum of **10 activities**. Use the table of contents or bid schedule as the basis for defining activities.
  - 3. Note periods of non-work when the non-working period exceeds three consecutive calendar days.
  - 4. When employing "S" curve analysis, plot contract time vs. percent of contract completed.

### 1.5 CRITICAL PATH SCHEDULE

- A. Plan and record construction of Project using a conventional critical path network analysis system:
  - 1. Use activity-on-node (AON) or activity-on-arrow (AOA) format.
  - 2. Divide long activities into small units so no single activity exceeds a total flow time (including float time) of **20 calendar days**.
  - 3. Show finish to start path of activities. Schedule activities from right to left. Show longest construction time.
- B. Precedence diagramming method (PDM) with start-to-start, finish-to-finish, and start-to-finish relationships are not acceptable.

### 1.6 CONTENT OF SCHEDULES

- A. **Title Block:** Show on each page:
  - 1. Project title, number and CONTRACTOR's name.
  - 2. Date of submittal, revision number, page number, and Project status cutoff date.
  - 3. Approval signatures for each Subcontractor.
  - 4. Legend of symbols, codes and abbreviations.
  - 5. Network nomenclature, e.g., "Detailed" or "Summary" or "Building Area" identification.
- B. **Activities:** The following is provided as a guide in the development of schedule activities. Show:
  - 1. Start and end dates of each phase of work.
  - 2. Shop Drawings, product data and Sample submittal dates, and dates required for submittal approvals.
  - 3. Decision dates for product specified by allowances, Selection of finishes, And critical material or equipment release order.
  - 4. Product procurement and delivery dates.
  - 5. Detailed construction activities, including all Subcontractors' work, oriented to identifiable work areas.
  - 6. Fabrication of special material, equipment and their installation and testing.
  - 7. Coordination activities, including utility relocations, separate contractors, etc.
  - 8. Constraints between interrelated activities. Ensure that those constraints are compatible and coordinated with separate contractors.
  - 9. Anticipated weather impacts, holidays, and change orders.
  - 10. Certificates of compliance, submittal reviews, Substantial Completion review and progress schedule reviews, especially if submittals or schedules are not approved.
  - 11. Specific dates for all special Inspections required before any utility "turn-on" including temporary power.

12. Cleanup, Final Inspection, Punch List.
13. Submittal of Record Drawings and maintenance manuals.
14. Anything that affects Work Completion.

#### 1.7 FLOAT

- A. Where float time exists, show activities at late-start/late-finish times and periods.
- B. Allocate float time in the best interests of the Work. Float time shall not be owned solely by CONTRACTOR.
- C. ENGINEER may notify CONTRACTOR of OWNER's claim to use any float time at any time.

#### 1.8 REVISIONS

- A. Revise the progress schedule if work falls behind.
- B. Provide written narratives describing cause of delay for each impacted activity. Identify any cost to be charged against the OWNER.
- C. Indicate progress of each activity, and new completion date of each activity.
- D. Identify changes in scope and other changes since previous submittal.
- E. Identify all planned actions for construction recovery such as:
  1. Use of overtime or extended work hours and extended workweek.
  2. Use of additional equipment.
  3. Use of additional crews, or other auxiliary forces.
  4. Projected cost to the OWNER.
- F. Add extra work to schedule at no additional cost to OWNER, except as identified by Change Order.

#### 1.9 DISTRIBUTION

- A. Distribute copies of schedule per the General Conditions. Instruct recipients to promptly report, in writing, problems anticipated by projections shown.

#### 1.10 PERFORMANCE

- A. Prosecute Work in accordance with and measure all progress against the progress schedule.

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#### **PART 2 PRODUCTS**

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Not Used

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#### **PART 3 EXECUTION**

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Not Used

END OF SECTION



## SECTION 01 33 00 SUBMITTAL PROCEDURE

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### PART 1 GENERAL

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#### 1.1 SECTION INCLUDES

- A. General procedures and requirements for submittals during the course of construction.

#### 1.2 CONTRACTOR REVIEW

- A. Review submittals before transmittal. Determine and verify field measurements, field construction criteria, manufacturer's catalog numbers, and conformance of submittal with requirements of Contract Documents.
- B. Coordinate submittals with requirements of Work and of Contract Documents.
- C. Sign or initial each sheet of Shop Drawings and product data, and each sample label to certify compliance with requirements of Contract Documents. Notify ENGINEER in writing at time of submittal, of any deviations from requirements of Contract Documents.
- D. Do not fabricate products or begin work that requires submittals until return of submittal with ENGINEER acceptance.

#### 1.3 PROCEDURE

- A. Transmit submittals to ENGINEER under transmittal form. Submit the number of copies that CONTRACTOR requires, plus the number of copies required by ENGINEER.
- B. Comply with submittal sequences shown in the progress schedule.
- C. When required by Laws and Regulations, affix licensed professional's stamp to submittal documents.
- D. Identify pertinent Drawing sheet and detail number, and Specification section number.
- E. Identify deviations from Contract Documents.
- F. Identify the date when ENGINEER must complete review of submittal.
- G. Provide space for CONTRACTOR and ENGINEER review stamps.
- H. After ENGINEER's review of submittal, revise and resubmit as required, identifying changes made since previous submittal.
- I. Distribute copies of reviewed submittals to concerned persons. Instruct recipients to promptly report any inability to comply with provisions.

#### 1.4 SHOP DRAWINGS

- A. Present drawings in a clear and thorough manner. Title each drawing with Project name and number. Identify each element of drawings by reference to sheet number and detail or equipment schedule.



- B. Identify field dimensions. Show relation to adjacent or critical features or work or products.
- C. Provide sheet size adequate for ENGINEER's review.

### 1.5 **PRODUCT DATA**

- A. Submit only pages which are pertinent. Mark each copy of standard printed data to identify pertinent products, referenced to specification section and article number. Show reference standards, performance characteristics, and capacities; wiring and piping diagrams and controls; component parts; finishes; dimensions; and required clearances.
- B. Modify product data by deleting information that is not applicable to the Work or by marking each copy to identify pertinent data.
- C. Supplement standard information, if necessary, to provide additional information applicable to the Work.
- D. Provide manufacturer's preparation, assembly and installation instructions.

### 1.6 **SAMPLES**

- A. Submit 1 of each Sample required by Contract Documents. Samples shall show the quality, type, range of color, finish and texture of the material.

### 1.7 **CERTIFICATES**

- A. Submit certificates, in duplicate, in accordance with requirements of each specification section.

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**PART 2    PRODUCTS**

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Not Used

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**PART 3    EXECUTION**

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Not Used

END OF SECTION

## SECTION 01 35 10 ACCEPTANCE

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### PART 1 GENERAL

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#### 1.1 SECTION INCLUDES

- A. ENGINEER responsibilities for acceptance.
- B. Dispute resolution.

#### 1.2 DEFINITIONS

- A. **Acceptance Testing:** Testing done to verify product or work complies with the Contract Documents. ENGINEER usually accomplishes testing. CONTRACTOR's control testing is sometimes used.
- B. **Independent Testing Agency:** A testing agency NOT owned by, affiliated with, or in any way associated with CONTRACTOR, or any of CONTRACTOR's Subcontractors and Suppliers, that is accredited by a national authority.
- C. **Lot:** A lot is an isolated quantity of material produced essentially by the same process. Example: One (1) day production or 1500 tons.
- D. **Sample:** A sample is (1) one measurement or count that represents a part or all of the Lot. Example: Five density measurements that represent the days' production (or Lot) are five (5) separate Samples.

#### 1.3 ACCEPTANCE

- A. **Acceptance of Product and Material:** Based upon visual examination or physical testing. ENGINEER may have such examination or testing done by a separate agency.
- B. **Control Testing:** ENGINEER retains right to accept or reject material or work based upon CONTRACTOR's control testing. Should ENGINEER choose to use CONTRACTOR's control testing for acceptance, the following conditions must be met:
  - 1. CONTRACTOR's testing agency meets Section 01 45 00 requirements.
  - 2. CONTRACTOR has and follows an acceptable quality control plan.
  - 3. Test results are submitted within 48 hours of test.
  - 4. Acceptance criteria are met.
- C. **Acceptance of Lots:** Samples in a Lot will be randomly collected:
  - 1. A Lot may be evaluated on the basis of fewer Samples when the minimum specified number of Samples cannot be collected.
  - 2. A Lot will not be accepted until ENGINEER accepts all sub-lots.
  - 3. A Lot with a defective sub-lot may be accepted at reduced pay if an appropriate pay factor is used to determine pay adjustment for the whole Lot. **DO NOT apply reduced pay only against defective**

**sub-lots.**

- D. **Submittals:** Acceptance of submittal data supersedes specified criteria. Example; Mix design acceptance may alter specified mix design criteria.

**1.4 DEFECTIVE WORK**

- A. Failure to detect any defective work or materials does not prevent later rejection when such defect is discovered, nor does it obligate ENGINEER for acceptance.
- B. If work or material is obviously defective, it must be corrected even if it or they are not a part of a set of random samples.
- C. Product or work that is assessed a pay adjustment or is later found defective does not reduce or change warranty provisions.

**1.5 DISPUTE RESOLUTION**

- A. CONTRACTOR must provide basis of disagreement in writing to ENGINEER.
- B. If CONTRACTOR desires to do any retesting, CONTRACTOR must submit a written plan to ENGINEER for approval. Any testing done without ENGINEER’s written approval will be rejected.
- C. Retesting must be performed by a mutually acceptable Independent Testing Agency.
- D. Retesting for acceptance will be done at no cost to the OWNER.
- E. ENGINEER reserves sole right not to utilize the retest results for evaluation of the work.

**PART 2 PRODUCTS**

Not Used

**PART 3 EXECUTION**

Not Used

END OF SECTION

## SECTION 01 42 19 REFERENCES

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### PART 1 GENERAL

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#### 1.1 SECTION INCLUDES

- A. Acronyms used in Contract Documents for reference standards.
- B. Applicability of referenced standards.
- C. Provision of referenced standards at site.

#### 1.2 QUALITY ASSURANCE

- A. For products or workmanship specified by trade association or government agency, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. The latest edition of the standards and their supplements referenced as a part of any Section are incorporated in that Section to the extent specified therein. In any case of conflict, the requirements of the Section shall prevail. The date of the standard is that in effect as of the bid date, or date of OWNER-CONTRACTOR agreement when there are no bids, except when a date is specified.
- C. When required by individual specification Section, obtain copy of standard. Maintain copy at job site during submittals, planning, and progress of the specific work, until Substantial Completion.

#### 1.3 TRADE ASSOCIATIONS

- A. Acronyms for industry standards.
  - AAMA American Architectural Manufacturer's Association.
  - AAN American Association of Nurserymen, Inc.
  - AASHTO American Association of State Highway and Transportation Officials:
  - ACI ACI Standards:
  - ACPA American Concrete Pipe Association.
  - AGC Associated General Contractors of America.
  - AI Asphalt Institute.
  - AIA American Institute of Architects.
  - AISC American Institute of Steel Construction.
  - AMRL Aashto Materials Reference Library.
  - AISI American Iron Standards Institute.
  - ANSI American National Standards Institute.
  - APA American Plywood Association.
  - APWA American Public Works Association.
  - ASME American Society of Mechanical Engineers.
  - ASPA American Sod Producers Association.

|          |   |
|----------|---|
| ASSE     | American Society of Sanitary Engineering.                 |
| ASTM     | American Society for Testing and Materials.               |
| ATSSA    | American Traffic Safety Services Association, Inc.        |
| AWPA     | American Wood-Preservers' Association.                    |
| AWPB     | American Wood-Preservers' Bureau.                         |
| AWS      | American Welding Society.                                 |
| AWWA     | American Water Works Association.                         |
| BIA      | Brick Institute of America.                               |
| CLFMI    | Chain Link Fence Manufacturers Institute.                 |
| CRSI     | Concrete Reinforcing Steel Institute.                     |
| CSI      | Construction Specifications Institute.                    |
| EIA      | Electronic Industries Association.                        |
| GRI      | Geosynthetic Research Institute                           |
| ICBO     | International Conference of Building Officials.           |
| ICEA     | Insulated Cable Engineer's Association.                   |
| ICPI     | Interlocking Concrete Pavement Institute.                 |
| IMIAC    | International Masonry Industry All-Weather Council.       |
| IMSA     | International Municipal Signal Association.               |
| ISA      | International Society of Arboriculture.                   |
| ITE      | Institute of Transportation Engineers.                    |
| MBMA     | Metal Building Manufacturer's Association.                |
| NAA      | National Arborist Association.                            |
| NASSCO   | National Association of Sewer Service Companies           |
| NEC      | National Electric Code (from NFPA).                       |
| NEMA     | NEMA.   |
| N.F.P.A. | National Forest Products Association.                     |
| NFPA     | NFPA.   |
| NPA      | National Particleboard Association.                       |
| NPCA     | National Precast Concrete Association.                    |
| NSF      | National Sanitation Foundation.                           |
| PCA      | Portland Cement Association.                              |
| PCI      | Prestressed Concrete Institute.                           |
| PPI      | Plastic Pipe Institute.                                   |
| S.D.I.   | Steel Door Institute.                                     |
| SSPC     | Steel Structures Painting Council.                        |
| UBC      | Uniform Building Code (from ICBO).                        |
| UL       | Underwriters' Laboratories, Inc.                          |
| WAQTC    | Western Alliance for Quality Transportation Construction. |
| WWPA     | Western Wood Products Association.                        |

#### 1.4 GOVERNMENT AGENCIES

##### A. Acronyms for Federal and State governments.

|     |   |
|-----|---|
| CE  | Corps of Engineers.                           |
| CS  | Commercial Standard.                          |
| DOT | Department of Transportation (Federal Highway |

|      |  |
|------|--|
|      | Administration).   |
| FS   | Federal Specification (General Services Administration). |
| MIL  | Military Standardization Documents.                      |
| NBS  | National Bureau of Standards.                            |
| PS   | Product Standard of NBS.                                 |
| REA  | Rural Electrification Administration.                    |
| UCFC | Utah Community Forest Council.                           |
| UDOT | Utah Department of Transportation.                       |
| USPS | U.S. Postal Service.                                     |

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| <b>PART 2</b> | <b>PRODUCTS</b> | Not Used |
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| <b>PART 3</b> | <b>EXECUTION</b> | Not Used |
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END OF SECTION



## SECTION 01 43 00 QUALITY ASSURANCE

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### PART 1 GENERAL

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#### 1.1 SECTION INCLUDES

- A. CONTRACTOR responsibilities for quality assurance.

#### 1.2 WORKMANSHIP

- A. Employ workers, Subcontractors and Suppliers who can produce the specified quality.
- B. Supervise and manage workmanship and site conditions so work complies with Contract Documents.
- C. Comply with industry standards except where more restrictive tolerances, specified requirements, or precise workmanship is required.

#### 1.3 INSTALLER

- A. **Qualifications:** Employ installers with at least three (3) years of successful installation experience on work similar to that required for Project.
- B. **Certificates:** When required or request by ENGINEER, submit copy of installer's certifications issued by certification agency.
- C. **Field Services:**
  - 1. Examine areas and conditions under which materials and products are to be installed.
  - 2. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to installer.
  - 3. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration and racking.
  - 4. Make new finishes match adjacent or old finishes.

#### 1.4 MANUFACTURER

- A. **Qualifications:** Employ firms regularly engaged in manufacture of materials and products of types and sizes required, whose products have been in satisfactory use in similar service for not less than five (5) years.
- B. **Instructions:** When required in individual Section, submit manufacturer's instructions in the quantity required for product data, delivery, handling, storage, assembly, installation, start-up, adjusting, balancing, and finishing as appropriate:
  - 1. Should instructions conflict with Contract Documents, request clarification before proceeding.
  - 2. Require compliance with instructions in full detail, including each step in sequence.



- C. **Certificates:** When required or request by ENGINEER, prove that manufacturer’s product meets or exceeds specified requirements.
- D. **Field Services:** Provide qualified representative to observe field conditions, conditions of surfaces and installation, quality of workmanship and start-up of equipment. Test, adjust, and balance equipment. Make written report of observations and recommendations to ENGINEER.

1.5 **MOCK-UPS**

- A. Erect field samples and mock-ups in location(s) acceptable to ENGINEER.
- B. Assemble and erect complete, with specified attachment and anchorage devices, flashings, seals, finishes, and similar items.

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| <b>PART 2    PRODUCTS</b> | Not Used |
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| <b>PART 3    EXECUTION</b> | Not Used |
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END OF SECTION

**SECTION 01 43 40**  
**RESIDENT SUPERINTENDENT**

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**PART 1 GENERAL**

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**1.1 SECTION INCLUDES**

- A. Minimum qualifications.
- B. Duties in general.

**1.2 QUALIFICATIONS**

- A. Fluent in English.
- B. Completed at least three (3) projects of similar size and nature as the one specified in the Contract Documents.
- C. Capable and authorized to take prompt corrective measures to protect the environment and public health, and to protect the health and safety of workers.
- D. Authorized to approve Change Orders.

**1.3 DUTIES IN GENERAL**

- A. **On-site Presence:** Be on-site during work activity.
- B. **English Proficiency:** Keep a person at each work location who is fluent in English who can respond to the concerns of anybody affected by construction.
- C. **Contract Documents:**
  - 1. Know the content and intent of the Contract Documents.
  - 2. Keep on-site all construction Plans; Project Manual; Plans or Specifications associated with updates and Change Orders, Submittals; traffic control plans; copies of the Standard Plans and Standard Specifications.
- D. **Labor:** Provide adequate labor to operate construction equipment, finish concrete, perform land survey work, or to monitor or adjust traffic and pedestrian barricades.
- E. **Subcontractors and Suppliers:** Direct means and methods of work so their work complies with Plans and Specifications.
- F. **Safety and Protection:** Enforce the work site safety plan. Protect ENGINEER's personnel, the general public and the environment per state or federal Laws and Regulations.
- G. **Quality Assurance:** When materials and installed work require laboratory testing, verify required laboratory personnel are present to do the tests and the tests are made per industry standard.
- H. **Conflicts:** Notify ENGINEER of any drawing, specification, or design conflict so it can be resolved before construction is adversely affected. Recommend any desirable changes to ENGINEER.

1.4 **CONTRACTOR’s DUTIES**

- A. Empower Resident Superintendent with all necessary authority, equipment, product, labor and budget to prosecute the Work within the Contract Time.
- B. Suspend Work if Resident Superintendent is not on-site or if any of the Section requirements in this manual are not being met. Contract Time shall continue to run.
- C. Replace the Resident Superintendent with one acceptable to the ENGINEER when directed by the ENGINEER.

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| <b>PART 2    PRODUCTS</b> | Not Used |
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| <b>PART 3    EXECUTION</b> | Not Used |
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END OF SECTION

## SECTION 01 45 00 QUALITY CONTROL

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### PART 1 GENERAL

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#### 1.1 SECTION INCLUDES

- A. CONTRACTOR responsibilities for quality control.

#### 1.2 QUALITY ASSURANCE

- A. Employ an agency or staff to assure installed product and materials comply with Contract Documents, and to assure inspections, tests, and other services comply with industry standards.
- B. Use an AMRL (AASHTO Materials Reference Library) certified laboratory that has personnel certified by WAQTC (Western Alliance for Quality Transportation Construction).
- C. When requested by ENGINEER, provide a professional opinion from a testing agency concerning test results and quality of work covered by testing performed.
- D. Do more testing, if, in ENGINEER's opinion, work is not being adequately controlled.

#### 1.3 TESTING AGENCY

- A. Provide sufficient personnel and cooperate with ENGINEER and CONTRACTOR in performing testing service.
- B. Obtain and secure samples using procedures specified in the applicable testing code.
- C. Perform product testing in accordance with applicable requirements of the Contract Documents.
- D. Correlate tests with ENGINEER's acceptance tests.
- E. When an out-of-tolerance condition exists, perform additional control testing until tolerance is attained.
- F. Report any non-compliance of materials and mixes to CONTRACTOR and ENGINEER immediately.

#### 1.4 SUBMITTALS – CONTRACTOR

- A. **Before Construction:** Identify:
  - 1. Name, address and telephone number of testing agency.
  - 2. Person whom agency has charged with engineering managerial responsibility.
  - 3. Licensed professional for testing agency who is to review services.
  - 4. Names and levels of certification and years of experience of testing agency's laboratory and field technicians.

- B. **During Construction:** Submit quality control test data requested by ENGINEER to demonstrate work performed complies with Contract Documents.

#### 1.5 SUBMITTALS – TESTING AGENCY

- A. **During Construction:** Submit field test results immediately to ENGINEER and CONTRACTOR or not later than day of test. Submit laboratory test results within 48 hours of determination.
- B. **After Construction:** Submit a final summary report in tabular form. Show each failed test and its corresponding passing test.
- C. **Reports:** Include on all reports:
  - 1. Project title, number and date.
  - 2. Date, time and location of test.
  - 3. Name and address of material Supplier.
  - 4. Identification of product being tested and type of test.
  - 5. Testing results and interpretation of results.
  - 6. Name of technician(s) who sampled and who performed test.

#### 1.6 LIMITS ON TESTING AGENCY

- A. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
- B. Agency may not suspend work.
- C. Agency has no authority to determine acceptance for ENGINEER.
- D. Samples must be collected and secured only by the testing agency.

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## PART 2 PRODUCTS

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### 2.1 MATERIALS

- A. Material furnished from sources that have been found satisfactory under OWNER's or ENGINEER's normal testing and sampling procedures may be used in the Work.
- B. Materials that are supported with a Supplier's certificate of compliance may be used in the Work. Certificate must be in possession of CONTRACTOR for review by ENGINEER before use.

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## PART 3 EXECUTION

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Not Used

END OF SECTION

## SECTION 01 55 26 TRAFFIC CONTROL

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### PART 1 GENERAL

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#### 1.1 SECTION INCLUDES

- A. Traffic control requirements.

#### 1.2 REFERENCES

- A. ASTM D4956: Retroreflective Sheeting for Traffic Control.
- B. ATSSA: American Traffic Safety Services Association, Inc.
- C. Instructions to Flaggers. Publication of UDOT.
- D. MUTCD: Manual on Uniform Traffic Control Devices for Streets and Highways.
- E. Work Zone Traffic Control Guide: Publication of the Utah LTAP Center.

#### 1.3 SUBMITTALS

- A. Traffic control plan within 10 days of receiving the Notice of Intent to Award.
- B. Flagger or traffic control technician certificates when requested by ENGINEER.

#### 1.4 TRAFFIC CONTROL PLAN

- A. Create a traffic control plan using the following resources. Resolve discrepancies between resources in descending order shown:
  - 1. MUTCD.
  - 2. Work Zone Traffic Control Guide.
  - 3. ATSSA.
- B. Include the following documentation as part of the traffic control plan.
  - 1. Written description of phasing.
  - 2. Drawing showing phasing (if required for clarity).
  - 3. Drawing showing placement of traffic control devices.
- C. Show how to move pedestrians through or around the Work site.
- D. Show how to handle signalized intersections.
- E. Meet grade, slope and protection requirement of the Americans with Disabilities Act (ADA).

#### 1.5 TRAFFIC CONTROL TECHNICIAN

- A. Certified by ATSSA or AGC.

#### 1.6 FLAGGER

- A. Certified by ATSSA, AGC or UDOT.

- B. Equipment:
  - 1. 24" x 24" "Stop/Slow" sign.
  - 2. 6" to 8" long red wand for night flagging.
  - 3. Light plant for night flagging.
- C. Clothing:
  - 1. Clothed; full length pants and long or short sleeved shirt.
  - 2. Hard toed shoes.
  - 3. Lime Green, orange, or red-orange hardhat and vest.
  - 4. Night clothing to be reflectorized.

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## **PART 2 PRODUCTS**

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### **2.1 PAVEMENT MARKINGS, SIGNS, BARRICADES**

- A. MUTCD.
- B. Channelizing Devices: Crash worthy plastic cones, drums and barricades.
- C. Reflective Sheeting: ASTM D4956.
- D. Pavement Markings: Section 32 17 23.

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## **PART 3 EXECUTION**

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### **3.1 FLAGGING**

- A. MUTCD.

### **3.2 TRAFFIC CONTROL DEVICES**

- A. Install before work activities begin.
- B. Maintain to ensure proper, continuous function.
- C. Remove when no longer needed.

### **3.3 TEMPORARY PAVEMENT MARKINGS**

- A. Renew if stripes and markings have lost their original visual effectiveness.

END OF SECTION

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**SECTION 01 57 00**  
**TEMPORARY CONTROLS**

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**PART 1 GENERAL**

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**1.1 SECTION INCLUDES**

- A. Requirements for controlling surface and subsurface environmental conditions at a construction site, and related areas under the CONTRACTOR's responsibility.
- B. Requirements for removal of physical evidence of temporary controls upon completion of the Work.

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**PART 2 PRODUCTS**

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**2.1 MATERIALS**

- A. Temporary Materials: CONTRACTOR's choice.

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**PART 3 EXECUTION**

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**3.1 NOISE CONTROL**

- A. Use equipment that is equipped with noise attenuation devices. Comply with local Laws and Regulations.
- B. Control construction noise in residential areas from 9:00 pm to 7:00 am.

**3.2 DUST AND MUD CONTROL**

- A. Comply with Utah State air quality regulations.
- B. Provide suitable equipment to control dust or air pollution caused by construction operations.
- C. Provide suitable mud and dirt containment, so Work site, access roadways and properties adjacent to the Work site are kept clean.

**3.3 SURFACE WATER CONTROL**

- A. Control all on-site surface water. Provide proper drainage so flooding of the site or adjacent property does not occur.
- B. Provide and maintain ample means and devices with which to promptly remove and properly dispose of all water entering the site.
- C. Immediately before suspension of construction operations for any reason, provide proper and necessary drainage of Work site area.
- D. Provide berms or channels as necessary to prevent flooding or saturation of Subgrade. Promptly remove all water collecting in depressions.



- E. Dispose of water in a manner that will not cause damage to adjacent areas or facilities.

### 3.4 **GROUND WATER CONTROL**

- A. Provide a dewatering system sufficient to maintain excavations and foundations dry and free of water on a 24 hour basis.
- B. Notify ENGINEER, in writing, if groundwater conditions differ from conditions shown in the Bid Documents, or in any soil test data that has been supplied.
- C. Remove all dewatering facilities when no longer required.
- D. Dispose of water in a manner that will not cause damage to adjacent or downstream areas or facilities.

### 3.5 **POLLUTION CONTROL**

- A. **Soil:** Prevent contamination of soil from discharge of noxious substances (including engine oils, fuels, lubricants, etc.). Excavate and legally dispose of any such contaminated soil off-site, and replace with acceptable compacted fill and topsoil.
- B. **Water:** Prevent disposal of wastes, effluent, chemicals, or other such substances adjacent to or into streams, waterways, sanitary sewers, storm drains, or public waterways. Perform any emergency measures required to contain any spillage.
- C. **Air:** Control atmospheric pollutants.

### 3.6 **EROSION CONTROL**

- A. Use measures such as berms, dikes, dams, sediment basins, fiber mat netting, gravel, mulches, slopes, drains and other erosion control devices or methods to prevent erosion and sedimentation.
- B. Provide construction and earthwork methods which control surface drainage from cut, fill, borrow, and waste disposal areas, to prevent erosion and sedimentation.
- C. Inspect earthwork during execution to detect any evidence of the start of erosion. Apply corrective measures as required.

END OF SECTION

**SECTION 01 64 00**  
**OWNER-FURNISHED PRODUCTS**

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**PART 1 GENERAL**

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**1.1 SECTION INCLUDES**

- A. OWNER and CONTRACTOR responsibilities for items furnished by the OWNER.

**1.2 OWNER'S RESPONSIBILITIES**

- A. Arrange for delivery of Shop Drawings, product data, Samples, manufacturer's instructions, and certificates to CONTRACTOR.
- B. Deliver Supplier's bill of materials to CONTRACTOR.
- C. Arrange and pay for delivery to site in accordance with CONTRACTOR's progress schedule.
- D. Inspect deliveries jointly with CONTRACTOR.
- E. Submit claims for transportation damage.
- F. Arrange for replacement of damaged, defective, or missing items.
- G. Arrange for manufacturer's field services. Arrange for and deliver manufacturer's warranties and bonds to CONTRACTOR.

**1.3 CONTRACTOR'S RESPONSIBILITIES**

- A. Designate submittal and delivery dates for each product in a schedule of OWNER furnished items. Submit this schedule concurrently with the first submission of the progress schedule.
- B. Review Shop Drawings, product data, Samples, and other submittals.
- C. Inspect deliveries jointly with ENGINEER, record shortages, and damaged or defective items.
- D. Handle products at site, including uncrating and storage.
- E. Protect products from damage, and from exposure to element.
- F. Assemble, install, connect and adjust products.
- G. Arrange for installation Inspections required by public authorities.
- H. Repair or replace items damaged or lost.

**1.4 CONSTRUCTION DELAY**

- A. If OWNER furnished items may cause delay in the critical path of progress schedule notify ENGINEER in writing. Only changes to the critical path will be evidence as changes in the Contract Time.

**PART 2   PRODUCTS**

Not Used

**PART 3   EXECUTION**

Not Used

END OF SECTION

**SECTION 01 65 00**  
**PRODUCT DELIVERY AND HANDLING**

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**PART 1 GENERAL**

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**1.1 SECTION INCLUDES**

- A. Basic requirements for product delivery and handling on site.

**1.2 DELIVERY**

- A. Arrange for delivery of products in accordance with progress schedule to facilitate instruction before installation.
- B. Coordinate deliveries to avoid conflict with work, conditions at site, and:
1. Work of separate contractors, or OWNER.
  2. Limitations of storage space.
  3. OWNER's use of premises.
- C. Deliver products in undamaged condition in original containers or packaging, with identifying labels for handling, storing, unpacking, protecting and installing intact and legible.
- D. Partial deliveries of component parts of equipment shall be clearly marked to identify the equipment, to permit easy accumulation of parts, and to facilitate assembly.
- E. Immediately upon delivery, inspect shipment to determine:
1. Product complies with requirements of Contract Document reviewed submittals.
  2. Quantities are correct.
  3. Containers and packages are intact, labels are legible.
  4. Products are properly protected and undamaged.

**1.3 PRODUCT HANDLING**

- A. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction space.
- B. Coordinate delivery with installation time to ensure minimum holding time for items that are hazardous, easily damaged, or sensitive to deterioration, theft and other losses.
- C. Handle products to prevent bending or over-stressing.
- D. Lift heavy components at designated lifting points.
- E. Discard damaged products.

1.4 ACCESS

- A. Identify access to CONTRACTOR's work and office area by use of signs so agents, delivery trucks, and other parties desiring contact with CONTRACTOR may do so.
- B. In security zones, prevent unauthorized personnel from proceeding outside of CONTRACTOR's work and office areas.

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**PART 2    PRODUCTS**

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Not Used

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**PART 3    EXECUTION**

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Not Used

END OF SECTION

**SECTION 01 66 00**  
**PRODUCT STORAGE AND PROTECTION**

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**PART 1 GENERAL**

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**1.1 SECTION INCLUDES**

- A. Storage, handling, and protection of products to be incorporated in the Work.

**1.2 SUBMITTALS**

- A. Submit a copy of written permission if property other than OWNER's is used to store materials or equipment.

**1.3 STORAGE**

- A. Store products immediately on delivery, per manufacturer's instructions, with seals and labels intact and legible.
- B. Store products subject to damage by elements in weather-tight enclosures:
  - 1. Maintain temperatures within ranges required by manufacturer's instructions.
  - 2. Provide humidity control for sensitive products, as required by manufacturer's instructions.
  - 3. Store unpacked products on shelves, in bins or in neat piles, accessible for inspection.
- C. Provide substantial platforms, blocking or skids to support fabricated products above ground, to prevent soiling or staining. Cover products, subject to discoloration or deterioration from exposure to the elements, with impervious sheet coverings. Provide adequate ventilation to avoid condensation.
- D. Store loose granular materials on solid surfaces to prevent mixing with foreign matter. Provide surface drainage to prevent flooding or ponding of rainwater. Prevent mixing with refuse or injurious materials. Do not store construction materials and equipment in municipal rights-of-way for more than five (5) days.
- E. Arrange storage in manner to provide easy access for inspection.

**1.4 STORAGE ON SIDEWALK, CURB AND GUTTER**

- A. Do not remove, block, or otherwise render sidewalks unusable by either storage of construction equipment and materials, or construction procedures used, unless a safe, usable, alternate walkway at least four (4) feet wide is provided.
- B. Maintain curb and gutter clean and clear of debris, dirt, or excavated materials at all times.

**1.5 MAINTENANCE OF STORAGE**

- A. Maintain periodic system of inspection of stored products on scheduled basis to assure that:
  - 1. State of storage facilities is adequate to provide required conditions.
  - 2. Required environmental conditions are maintained.
  - 3. Surfaces of products exposed to elements are not adversely affected.
- B. Any weathering of products, coatings and finishes is not acceptable.

**1.6 STORAGE AREA RESTORATION**

- A. Remove all plant, equipment and stockpiles from the work site.
- B. Restore all storage areas and service roads to prior condition without any additional cost to OWNER.

**1.7 PROTECTION**

- A. Installed Product: Provide protection of installed products to prevent damage from subsequent operations. Remove when no longer needed, before completion and acceptance of Work.
- B. Finished Surfaces: Provide coverings to protect finished surfaces from damage:
  - 1. Cover projections, wall corners, jambs, sills and soffits of openings, in areas used for traffic and for passage of products in subsequent work.
  - 2. Protect finished floors and stairs from dirt and damage:
    - a. In areas subject to foot traffic, secure heavy paper, sheet goods, or other materials in place.
    - b. For movement of heavy products, lay planking or similar materials in place.
    - c. For storage of products, lay tight wood sheathing in place.
    - d. Cover walls and floor of elevator cars, and unprotected surfaces of car doors when used by construction personnel.
- C. Waterproofed and roofed surfaces:
  - 1. Prohibit use of surfaces for traffic of any kind, and for storage of any products.
  - 2. When some activity must take place in order to complete work, obtain recommendations of Supplier and installer for protection of surface.
    - a. Install recommended protection and remove on completion of that activity.
    - b. Restrict use of adjacent unprotected areas.
- D. Security: Provide security for materials, equipment and tools. OWNER will not protect Work from vandalism.

1.8 PROTECTION OF LAWNS AND LANDSCAPING

- A. Protect planted lawn and landscaped areas from pedestrian and vehicular traffic.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION





## SECTION 01 71 13 MOBILIZATION AND DEMOBILIZATION

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### PART 1 GENERAL

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#### 1.1 SECTION INCLUDES

- A. Mobilization and demobilization requirements.

#### 1.2 REFERENCES

- A. **APWA (Utah) Standards:**

Plan 412 Invert Cover.

#### 1.3 DEFINITIONS

- A. **Mobilization** includes bringing all necessary equipment to the site to do the Work. It includes all labor, materials, and equipment to set up temporary offices, buildings, facilities, signs, and utilities.
- B. **Demobilization** includes removing all construction equipment and debris so site is left clean.

#### 1.4 TEMPORARY FACILITIES

- A. Field Office: CONTRACTOR's choice.
- B. Utilities: Provide power, telephone, water, storm and sanitary facilities, and all other temporary utilities required.
- C. Security and Protection: Construct and maintain temporary fencing for the protection of materials, tools, and equipment. Obtain prior approval for all fence locations.
- D. Construction and Support: Set up and maintain in a neat and orderly manner temporary roads and paving, dewatering facilities, enclosures, identification signs and bulletin boards, waste disposal and temporary heat. Provide and maintain temporary all weather pedestrian walk ways and road detours.
- E. Invert Cover: Install covers as shown in APWA Plan 412 or Drawings. Installation must be tight so no debris can by-pass the cover and enter the piping below.

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### PART 2 PRODUCTS

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#### 2.1 MATERIALS

- A. Temporary Materials: CONTRACTOR's choice.

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**PART 3 EXECUTION**

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**3.1 INSTALLATIONS**

- A. Relocate and modify temporary facilities as required.
- B. Install temporary utility service or connect to existing service.
- C. Locate field offices, storage sheds, sanitary facilities and other temporary construction and support facilities for easy access. Use of gasoline-burning, open flame, or salamander type heating units is prohibited.
- D. Use local standards and codes for erection of adequate fences and barricades. Maintain all signing, barricades, fencing, drainage, and other items as required to protect public and private property from damage caused by construction operations.
- E. Coordinate location of storage areas to avoid interference with drainage, traffic, or private property.
- F. Provide and maintain all temporary signage required by the Work.

**3.2 REMOVALS**

- A. Completely remove temporary materials and equipment:
  - 1. When construction needs can be met because of permanent installation, and
  - 2. At completion of the Work.
- B. Clean or repair damage caused by installation or use of temporary facilities.
- C. Restore areas to original or to specified conditions at completion of the Work.

END OF SECTION

**SECTION 01 71 23**  
**CONSTRUCTION LAYOUT**

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**PART 1 GENERAL**

---

**1.1 SECTION INCLUDES**

- A. Construction surveying requirements.

**1.2 SUBMITTALS**

- A. Before contract closeout submit:
  - 1. Documentation to verify accuracy of survey work.
  - 2. When required by Laws and Regulations, submit a certificate signed by a licensed professional certifying that elevations and locations of improvements conform with the Contract Documents.
  - 3. All survey data, survey information showing dimensions, location angles and elevations of construction on contract Record Documents.

**1.3 SURVEY REFERENCE POINTS**

- A. Known basic horizontal and vertical control points for the Project are indicated.
- B. Locate and protect survey control points before starting site work, and preserve all permanent reference points during construction.
- C. Notify ENGINEER in writing within 24 hours of any survey work changes or clarifications required for Project. Secure written authorization before making any changes or relocations.
- D. Report in writing when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
- E. Replace construction stakes damaged or destroyed by CONTRACTOR at no additional cost to OWNER.

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**PART 2 PRODUCTS**

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Not used

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**PART 3 EXECUTION**

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**3.1 PROJECT SURVEY REQUIREMENTS**

- A. Any work done without line and grade established by CONTRACTOR is at CONTRACTOR's own risk.
- B. Locate and layout by instrumentation and similar appropriate means to include but not limited to:
  - 1. Pavement subgrade and finish grade.
  - 2. Site improvements:
    - a. Stakes for grading, fill and topsoil placement.
    - b. Slope elevations.
    - c. Utility locations and invert elevations.
  - 3. Batter boards for structures.
  - 4. Retaining wall locations and elevations.
  - 5. Curb and gutter alignment and grade.
  - 6. Building foundations, column locations and floor levels.
  - 7. Controlling lines and levels required for civil, mechanical, and electrical trades.

END OF SECTION

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## SECTION 01 71 34 SURVEY REFERENCING

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### PART 1 GENERAL

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#### 1.1 SECTION INCLUDES

- A. Installation of reference marks.
- B. Making permanent records of marks set.

#### 1.2 SUBMITTALS

- A. Field notes in 8 1/2 inches x 11 inches format or in standard field book form. Before construction begins and after construction ends show the following:
  - 1. All corners, points, or monuments which may be disturbed, damaged, moved, removed, covered, or destroyed by construction activity. Describe their kind, size, location, and any other data relating thereto.
  - 2. All corners, points, or monuments which are replaced, established, or reestablished, lines of survey, bearings, basis of bearings, scale of drawing, structures containing reference marks, and picture drawings of each mark installed.
  - 3. Found corners, points, or monuments, describing in detail the size, type, location and ownership.
  - 4. A north arrow, length of lines, scale of drawing, weather, temperature, errors of closure, and method of adjustment.
  - 5. Land surveyor's signature and seal on each tie-sheet record.
- B. If any survey point, monument, or line is disturbed or destroyed before referencing (tie-out), reestablish that point, monument, or line at no additional cost to OWNER, and submit a record of survey plat to the governing agency to show how its location was reestablished.
- C. "Corner File Report" that complies with applicable Laws and Regulations.

#### 1.3 QUALITY ASSURANCE

- A. Comply with all pertinent surveying codes, Laws and Regulations including but not limited to Utah State Code Title 17 Chapter 23 – County Surveyor.

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### PART 2 PRODUCTS

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**2.1 BRASS TAG**

- A. Imprinted with land surveyor's license number or business name fastened with a 1 inch long brad to:
  - 1. a 3/8 inch diameter and 1-1/4 inch deep lead plug pounded into a hole drilled in a concrete structure, or
  - 2. a cement water paste poured into the top of a two (2) inches diameter 24 inches long cast iron pipe driven into the ground.
- B. Depress tag and brad a minimum of 1/8 inch below surface plane of concrete structure or end of pipe.

**2.2 REBAR AND CAP**

- A. No. 5 deformed rebar at least 24 inches long.
- B. Installed free from movement.
- C. Cap bears the license number, business name, or government agency name.

**2.3 RECORD OF SURVEY**

- A. Mylar sheet complying with applicable Laws and Regulations for providing plat survey control.

**2.4 OTHER MATERIALS**

- A. Select all other materials, not specifically described but required for proper completion of work of this Section.

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**PART 3 EXECUTION**

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**3.1 REFERENCE MARKS**

- A. Furnish and install reference marks set in concrete or mortar in sufficient number and durability to assure the perpetuation of facile replacement of any survey point, monument, or line.
- B. Install reference marks where location of section corner or survey monuments are likely to be disturbed or destroyed, or where difficult terrain is encountered.
- C. When specified or for new subdivision work, install reference marks for lot lines in concrete curbs or sidewalks. If not available, install witness monuments in approved locations.

**3.2 REFERENCE SURVEY MONUMENTS BEFORE DISTURBANCE**

- A. Obtain local jurisdiction's monument permit not less than 72 hours before disturbing, damaging, moving, removing, covering, or destroying any existing survey monument.
- B. Pay all costs and submit all pertinent data when replacing monuments not referenced.

**3.3 REFERENCING SURVEY POINTS AND LINES**

- A. Reference all survey points and lines which may be disturbed or destroyed by construction operations using reference marks.
- B. Locate reference marks on lines or extensions of lines that the survey points designate.

END OF SECTION





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## SECTION 01 73 29

### CUTTING AND PATCHING

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#### PART 1 GENERAL

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##### 1.1 SECTION INCLUDES

- A. Cutting and patching to:
  - 1. Fit several parts together, to integrate with other work.
  - 2. Uncover work to install work done out of sequence.
  - 3. Remove and replace defective and non-conforming work.
  - 4. Remove Samples of installed work for testing.
  - 5. Provide openings in non-structural elements for penetrations of mechanical and electrical work.

##### 1.2 SUBMITTALS

- A. Submit written request in advance of cutting and patching that affects:
  - 1. Structural integrity of any element of Project.
  - 2. Integrity of weather-exposed or moisture-resistant element.
  - 3. Efficiency, maintenance, or safety of any operational element.
  - 4. Visual qualities of sight-exposed elements.
  - 5. Work of OWNER or separate contractor.
- B. Include in request:
  - 1. Identification of Project.
  - 2. Location and description of affected work.
  - 3. Necessity for cutting and patching.
  - 4. Description of proposed work, and products to be used.
  - 5. Alternatives to cutting and patching.
  - 6. Effect on work of OWNER or separate contractor.
  - 7. Written permission of affected separate contractor.
  - 8. Date and time work will be executed.

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#### PART 2 PRODUCTS

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##### 2.1 MATERIALS

- A. Those required for original installation.
- B. For any change in materials, submit request for substitution, Section 01 25 00 requirements.

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**PART 3 EXECUTION**

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**3.1 INSPECTION**

- A. Inspect existing conditions, including elements subject to damage or movement during modifications to completed work.
- B. After uncovering, inspect conditions affecting performance of work.
- C. Beginning of Modification work constitutes acceptance of existing conditions.

**3.2 PREPARATION**

- A. Provide supports to assure structural integrity of surroundings, devices and methods to protect other portions of work from damage.
- B. Provide protection from elements for areas which may be exposed by work.

**3.3 PERFORMANCE**

- A. Execute work by methods to avoid damage to existing structures and other work, and which will provide proper surfaces to receive patching and finishing.
- B. Employ original installer if possible to be responsible for modification work on weather-exposed and moisture-resistant elements, and exposed to view surfaces.
- C. Restore Work with new products per requirements of Contract Documents.
- D. Fit Work, to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- E. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for an assembly, refinish entire unit.

END OF SECTION

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**SECTION 01 74 13**  
**PROGRESS CLEANING**

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**PART 1 GENERAL**

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**1.1 SECTION INCLUDES**

- A. Cleaning and disposal of waste materials, debris, and rubbish.
- B. Cleaning of Work before Final Inspection.

**1.2 SUBMITTALS**

- A. Before Project Closeout: Certificate of disposal of Hazardous Waste if applicable.

**1.3 JOB CONDITIONS**

- A. On Site Burning: Not permitted.

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**PART 2 PRODUCTS**

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**2.1 CLEANING MATERIALS**

- A. Use only materials which will not create hazards to health or property, and which will not damage surfaces.
- B. Use only cleaning materials recommended by manufacturer of item being cleaned.

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**PART 3 EXECUTION**

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**3.1 CLEANING DURING CONSTRUCTION**

- A. Initiate and maintain a specific cleaning program to prevent accumulation of debris. Maintain areas under CONTRACTOR's control free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Provide covered containers for deposit of debris and rubbish.
- C. Periodically clean interior areas to provide suitable conditions for finish work.
- D. Remove debris and rubbish from closed or remote spaces before closing the space.
- E. Broom clean interior areas before start of surface finishing, and continue cleaning on an as-needed basis.
- F. Control cleaning operations so dust and other particulate will not adhere to wet or newly-coated surfaces.

**3.2 DISPOSAL DURING CONSTRUCTION**

- A. Regularly remove and legally dispose of waste materials, debris, and rubbish from site.
- B. Provide additional collections and disposal of debris whenever the periodic schedule is inadequate to prevent accumulation.

**3.3 CLEANING BEFORE FINAL INSPECTION**

- A. Site:
  - Clean exposed-to-view surfaces.
  - Remove waste, debris, and surplus materials from site.
  - Clean grounds; paved areas and sweep clean.
  - Rake clean other surfaces.
- B. Building:
  - Clean interior and exterior exposed-to-view surfaces.
  - Remove temporary protection and labels not required to remain.
  - Clean finishes free of dust, stains, films and other foreign substances.
  - Clean transparent and glossy materials to a polished condition. Polish reflective surfaces to a clear shine.
  - Vacuum clean carpeted and similar soft surfaces.
  - Clean resilient and hard-surface floors.
  - Clean surfaces of equipment; remove excess lubrication.
  - Clean plumbing fixtures to sanitary condition.
  - Clean permanent filters of ventilating equipment and replace disposable filters when units have been operated during construction; in addition, clean ducts, blowers, and coils when units have been operated without filters during construction.
  - Clean lighting fixtures and lamps.
  - Continue cleaning until acceptance.
  - Remove waste and debris from roofs, gutters, area ways, and drainage systems.

END OF SECTION

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## SECTION 01 75 16

### STARTUP PROCEDURES

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#### PART 1 GENERAL

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##### 1.1 SECTION INCLUDES

- A. Procedural requirements for start-up, testing, adjusting and balancing systems.

##### 1.2 COORDINATION

- A. Coordinate services with work of various trades to ensure rapid completion of services.
- B. Report any deficiencies noted during performance of services to allow immediate corrective action.

##### 1.3 JOB CONDITIONS

- A. Before start of testing, adjusting and balancing, verify required job conditions:
  - 1. Systems installation is complete and in full operation.
  - 2. Conditions are within a reasonable range relative to design conditions.
  - 3. Special equipment such as electronic equipment are in full operation.
- B. Verify that special product or equipment requirements for preparation, testing and balancing have been met for elements of each of the systems that require testing.

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#### PART 2 PRODUCTS

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##### 2.1 MATERIALS

- A. Provide material required to perform start-up of each respective item of equipment and system before beginning of test, adjust and balance procedures.

##### 2.2 VERIFICATION OF PERFORMANCE

- A. Provide an independent certifying association to provide information and assistance required to adjust and balance system.

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**PART 3 EXECUTION**

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**3.1 START-UP**

- A. Start up completed facility with appropriate personnel present.
- B. Perform specified services and if necessary employ and pay for a manufacturer approved organization to perform specified services.
- C. Provide appropriate utilities and instrumentation required for starting, testing, adjusting and balancing operations:
  - 1. Make instruments available to ENGINEER to facilitate spot checks during testing.
  - 2. Retain possession of instruments, remove from site at completion of services.
- D. Comply fully with procedural standards of certifying association under whose standards service will be performed.
  - 1. Execute each step of the prescribed procedure without omission.
  - 2. Accurately record the required data.

END OF SECTION

**SECTION 01 78 23**  
**OPERATION AND MAINTENANCE DATA**

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**PART 1 GENERAL**

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**1.1 SECTION INCLUDES**

- A. Preparation of operation and maintenance manual to include compilation of product data, related information, and instructions for systems and equipment.
- B. Instruction of OWNER's personnel in maintenance of products and in operation of equipment and systems
- C. Schedule of required submittals.

**1.2 FORMAT**

- A. Prepare data in the form of an instructional manual.
- B. Consult with ENGINEER to determine format requirements.

**1.3 CONTENTS, EACH VOLUME**

- A. Table of Contents: Provide title of Project; names, addresses, and telephone numbers of ENGINEER and CONTRACTOR with name of responsible parties, Schedule of products and systems, indexed to content of the volume.
- B. For Each Product or System: List names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
- C. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.
- D. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Record Documents as maintenance drawings.
- E. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.
- F. Guaranties and Warranties: Copies of each showing dates of expiration.

**1.4 MANUAL FOR EQUIPMENT AND SYSTEMS**

- A. Each Item of Equipment and Each System: Include description of unit or system, and component parts. Give function, normal operating characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
- B. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications.
- C. Include as installed color coded wiring diagram.



- D. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequence. Include regulation, control, stopping, shutdown and emergency instructions. Include summer, winter, and any special operating instructions.
- E. Maintenance Requirements: Include routine procedures and guide for troubleshooting; disassembly, repair and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- F. Provide servicing and lubrication schedule, and list of lubricants required.
- G. Include manufacturer's printed operation and maintenance instructions.
- H. Include sequence of operation by controls manufacturer.
- I. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- J. Provide as-installed control diagrams by controls manufacturer.
- K. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- L. Include test and balancing reports.
- M. Additional Requirements: As specified in individual Sections.

#### **1.5 INSTRUCTION OF OWNER'S PERSONNEL**

- A. Before Substantial Completion, instruct OWNER's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems, at agreed upon times.
- B. Use operation and maintenance manuals as basis of instruction. Review contents of manual with personnel in detail to explain all aspects of operation and maintenance.
- C. Prepare and insert additional data in Operating and Maintenance Manual when need for such data becomes apparent during instruction.

#### **1.6 SUBMITTALS**

- A. Submit two (2) copies of preliminary draft or proposed formats and outlines of contents before start of Work.
- B. For equipment, or component parts of equipment put into service during construction and operated by OWNER, submit documents within 10 days after acceptance.
- C. Submit one (1) copy of completed volumes in final form 15 days before Final Inspection. Revise content of documents as required before final submittal.
- D. Submit six (6) copies of revised volumes of data in final form within 14 calendar days after complete system start-up.

**PART 2   PRODUCTS**

Not Used

**PART 3   EXECUTION**

Not Used

END OF SECTION



**SECTION 01 78 39**  
**PROJECT RECORD DOCUMENTS**

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**PART 1 GENERAL**

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**1.1 SECTION INCLUDES**

- A. Requirements for collecting, maintaining, updating, and submitting Record Documents.

**1.2 DEFINITIONS**

- A. **Record Documents:** Those documents maintained and annotated by CONTRACTOR during construction for recording "as built" condition of the Work.

**1.3 CONSTRUCTION PHOTOGRAPHS**

- A. Provide electronic photographs when specified in the Contract Documents starting with a series of photographs before the start of any physical construction, and continuing for as long as the Work progresses:
  - 1. Provide not less than 12 different subjects or angles of view each time from different locations in the Project area at intervals not exceeding one (1) month.
  - 2. On each photograph indicate the date, job title, photograph identification, and direction the camera was facing.
  - 3. With each request for payment.
  - 4. Upon completion of the Work, submit all electronic pictures on disc. ENGINEER may request hard copies of the pictures.
- B. Secure ENGINEER's approval if a video tape is to be substituted for the photograph prints.

**1.4 DOCUMENTS ON SITE**

- A. Keep at job site 1 copy of each of the following, if issued for the Work:
  - 1. Contract Drawings.
  - 2. Project Manual.
  - 3. Addenda.
  - 4. Reviewed Shop Drawings, product data and Samples.
  - 5. Modifications to the Contract Documents.
  - 6. Field test records.
  - 7. Inspection certificates.
  - 8. Manufacturer's certificates.
  - 9. Survey documentation.
  - 10. Storm water pollution prevention plan (SWPPP).
  - 11. All related permits.

- B. Do not use record documents for construction purposes.
- C. Store Record Documents in a location, apart from documents used for construction.
- D. Maintain Record Documents in a clean, dry, legible condition.
- E. Provide adequate files and racks for storage of Record Documents that will allow ready access for review and updating.
- F. Make Record Documents available at all times for review and Inspection by ENGINEER.

### 1.5 MARKING DEVICES

- A. Red colored waterproof for all marking unless requested otherwise.

### 1.6 RECORDING

- A. Clearly and legibly label each document "PROJECT RECORD".
- B. Number Record Documents in a manner which will allow ready retrieval of documents and allow indexing of documents for submittal to ENGINEER.
- C. Update Record Documents as work occurs to show the current status of the Work.
- D. Do not permanently cover or conceal any work until all required information has been recorded on the Record Documents.
- E. Contract Drawings: Legibly mark contract Drawings to record following actual construction information:
  - 1. Measured depths of various elements of foundation or finish grading in relation to finish floor datum or other permanent benchmark.
  - 2. Measured horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements.
  - 3. Measured location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of construction.
  - 4. Field changes of dimension and detail.
  - 5. Changes made by contract Modifications.
  - 6. Details not contained in original contract Drawings.
- F. Project Manual and Addenda: Legibly update each to record:
  - 1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
  - 2. Changes made by contract Modifications.
  - 3. Other technical matters and details included in the Work, but not originally specified.
- G. Shop Drawings: Maintain reviewed Shop Drawings as Record Documents; legibly annotate drawings to record changes made to Shop Drawings.
- H. Product Data and Samples: Maintain reviewed product data and Samples as Record Documents; update and document any variations

from the reviewed product data and Samples after acceptance.

1.7 SUBMITTAL OF DOCUMENTS

- A. At the completion of the Work, submit all Record Documents.
- B. Accompany the submittal with a transmittal letter, in duplicate, containing:
  - 1. Submittal date.
  - 2. Project title and number.
  - 3. CONTRACTOR's name and address.
  - 4. Title and number of each Record Document.
  - 5. Certification that each document as submitted is complete and accurate.
  - 6. Signature of CONTRACTOR, or CONTRACTOR's authorized representative.

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| <b>PART 2</b> | <b>PRODUCTS</b> | Not Used |
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| <b>PART 3</b> | <b>EXECUTION</b> | Not Used |
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END OF SECTION



## SECTION 01 78 50 CLOSEOUT PROCEDURES

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### PART 1 GENERAL

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#### 1.1 SECTION INCLUDES

- A. Administrative provisions for Substantial Completion, acceptance of work, and Final Inspection.

#### 1.2 REFERENCES

- A. **APWA (Utah) Standards:**

Plan 110 Arrow diagram for project close-out.

#### 1.3 SUBSTANTIAL COMPLETION

- A. When Work, or designated portion thereof, is substantially complete, submit written notice with list of any outstanding items to be completed or corrected.
- B. After receipt of CONTRACTOR's certification of Work Completion, ENGINEER will make final inspection to determine status of completion.
- C. Should Work not be substantially complete, remedy deficiencies and re-submit a written notice.

#### 1.4 ACCEPTANCE OF WORK

- A. Protect Work until it is accepted.
- B. Neither ENGINEER's determination that Work is complete, nor acceptance thereof by the OWNER, shall operate as a bar to claim against the CONTRACTOR under the provisions of the contract documents.

#### 1.5 CLOSEOUT SUBMITTALS

- A. Record Documents: Section 01 78 39.
- B. Operation and Maintenance Data; Section 01 78 23.
- C. Evidence of payment to Subcontractors and Suppliers: Document 00 72 00, Final Application for Payment.
- D. Final Summary Report of CONTRACTOR's Testing Agency: Section 01 45 00 requirements.

#### 1.6 CLOSEOUT SCHEDULE

- A. See APWA Plan 110 requirements.



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**PART 2    PRODUCTS**

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Not Used

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**PART 3    EXECUTION**

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Not Used

END OF SECTION

**DIVISION 02**

**PROJECT CONSTRUCTION**

## SECTION 02100

### MEASUREMENT AND PAYMENT

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. Mobilization, traffic control and maintenance of traffic, erosion control
- B. Roadway Striping
- C. Removing and disposing of miscellaneous concrete items
- D. Construction new concrete curb and gutter, sidewalks, waterways, ADA ramps
- E. Furnishing, placing and compacting warm mix asphalt surface course, including gravel road base

##### 1.02 RELATED SECTIONS

- A. Section 012900 – Payment Procedures: criteria applicable to payment under a unit price or lump sum price.

##### 1.03 MEASUREMENT AND PAYMENT

- A. Measurement shall be made in units or lump sums, as described below.
- B. Payment shall be made at the unit price or lump sum price bid in the bid schedule for the items described below, which shall be payment in full for all costs of furnishing labor, tools, equipment, materials, testing, etc., to complete the items of work as specified and as indicated on the drawings.
- C. Bid items shown with letters and numbers, indicating schedule and item number.
- D. Mobilization (Bid Item No. A1):
  - 1. Basis for Measurement: Lump Sum.
  - 2. Basis for Payment: Includes all preparatory work and operations, including, but not limited to those necessary for movement of personnel, equipment, supplies and incidental items to the project site, both Sch A & B;
    - a. All work required as part of the city notification policy, as outlined in Section 00250 – Additional Instructions to Bidders, for establishment of all offices, buildings and other facilities necessary for work on the project; for furnishing, erecting and maintaining all necessary construction signs; and for all other work and operations which must be performed, or costs incurred, not otherwise paid for prior to beginning work on various items on the project site.
    - b. Payment for mobilization shall not exceed 10 percent of the actual total contract amount.
    - c. Payment for mobilization shall include all required erosion control devices to protect existing inlets within the project area of Sch. A & Sch. B.
      - a. Includes obtaining a Notice of Intent (NOI) from the Environmental Protection Agency's Central Database, Submitting and approval of a Storm Water Pollution Prevention Plan by the City of Cottonwood Heights.
- E. Traffic Control (Bid Item No. A2 & B1):
  - 1. Basis for Measurement: Lump Sum.
  - 2. Basis for Payment: Includes preparing traffic control plan; furnishing, erecting and maintaining traffic

control signs and barricades; message boards; flaggers; and all appurtenant work required for traffic control.

F. Furnish and install 4-inch Traffic Striping (White Color) (Bid Items No. A3):

1. Basis for Measurement: By the linear foot of traffic paint applied.
2. Basis for Payment: Includes all required layout; furnishing and applying traffic paint for pavement messages, symbols, of the size, type and color, as matching existing conditions, and as indicated and as directed by the City Inspector; and all appurtenant work to complete paint layout and application.

i) Contractor is responsible for any required survey for existing striping.

G. Furnish and install 12-inch white traffic paint for stop bar, complete (Bid Items No. A4):

1. Basis for Measurement: By the linear foot of traffic paint applied.
2. Basis for Payment: Includes all required layout; furnishing and applying traffic paint for pavement messages, symbols, of the size, type and color, as matching existing conditions, and as indicated and as directed by the City Inspector; and all appurtenant work to complete paint layout and application.

i) Contractor is responsible for any required survey for existing striping.

H. Reconstruct existing water valve boxes to grade, complete (Bid Item No A5):

1. Basis for Measurement: By the unit of each valve box actually reconstructed.
2. Basis for Payment: Includes all required earthwork, to include excavating to expose the existing water valve box, backfilling excavations and compacting backfill material; reconstructing the top portion of the valve box to grade, as required and as directed, to include all new materials needed; and all appurtenant work required to complete the reconstruction

I. Reconstruct existing sewer, storm drain, water, electric, and communications manholes to grade, complete (Bid Item No. A6 & B2):

1. Basis for Measurement: By the unit of each manhole actually reconstructed.
2. Basis for Payment: Includes all required earthwork, to include excavating to expose the existing manhole, backfilling excavations and compacting backfill material; reconstructing the top portion of the manhole to grade, as required and as directed, to include all new materials needed; and all appurtenant work required to complete the reconstruction.

J. Reconstruct Existing Survey Monuments to Grade (Bid Item No. A7 & B3):

1. Basis for Measurement: By the unit of each monument actually reconstructed.
2. Basis for Payment: Includes all required earthwork, to include excavating to expose the existing survey monuments, backfilling excavations and compacting backfill material; removing and reinstalling the monuments to grade, as required and as directed, to include all new materials needed; permitting and all appurtenant work required to complete the reconstruction.

K. Remove and dispose of existing asphalt roadway pavement, complete (Bid Item No. A9 & B5):

1. Basis for Measurement: By the square foot of existing asphalt pavement removed and disposed.
2. Basis for Payment: Includes all the required equipment and material to remove asphalt, haul off site to dispose, including all labor and haul costs, and dump fees.

H. Furnish, place and compact warm mix asphalt surface course, DM 1/2" 50 Blow, PG 58-28, Max RAP 15% by weight, complete (Bid Item No A10 & B6):

1. Basis for Measurement: By the square foot of asphalt surface, thickness in Bid Sch.
  2. Basis for Payment: Includes all required earthwork; labor, materials, and equipment needed for warm mix surface lay down, including compaction, tack coat prior to paving, supplying asphalt surface course mix to the site, placing, compacting, and rolling materials to the thickness indicated. Payment includes mix-design.
- I. Remove and replace existing 30-inch concrete curb & gutter, per city inspector, complete (Bid Items No. A8 & B4):
1. Basis for Measurement: By the linear foot of concrete curb and gutter actually removed and replaced.
  2. Basis for Payment: Includes all required earthwork, to include excavating and grading for curb and gutter, backfilling excavations, and compacting backfill; cutting, breaking-up and removing existing concrete curb and gutter, where indicated and as directed by the City Inspector; cutting, breaking-up and removing existing asphalt pavement as required and as directed; disposing of concrete and asphalt debris in an acceptable manner; furnishing, placing and compacting new gravel base, to 4-inch thick; constructing new concrete curb and gutter, including expansion joints, of the size and to the limits as indicated and as directed; and all appurtenant work to complete the removal and reconstruction
- P. Payment for Constructing the Concrete intersection Improvements in Bid items No. A11, A12, A13, A14, B7 & B8 shall include the following items of work, as directed by the item bid schedule description.
1. Basis for Measurement: Lump Sum
  2. Basis for Payment: Includes all items of work listed in paragraph "P", as applicable (See bid schedule description for more details). Includes all appurtenant work required to complete construction of the concrete improvements as described in bid schedule.
    1. Saw-cutting and breaking-up existing asphalt pavement and/or concrete pavement along existing curb and gutter or roll gutter, per APWA standards and removing material from roadway surfaces and disposing of material, as required, and as directed.
      - a. Removal of existing pavement shall be done prior to structural excavations and removal of existing curb and gutter or roll gutters.
    2. Saw-cutting existing curb and gutter or roll gutters, at the limits indicated in APWA standards and as directed; breaking up and removing concrete material, as directed; and disposing of concrete material in a legal manner.
    3. Saw-cutting existing sidewalk, as necessary to install ADA ramps (where applicable); breaking up and removing the concrete material, as directed; and disposing of concrete material in a legal manner.
    4. Removing and disposing of existing concrete waterways and structures
    5. Cost of excavation and grading material to required elevations (Best Fit based on existing slope); loading and placing materials in stockpile if it's to be re-used; removing excess and unsuitable material from site and disposing of material in an acceptable manner; scarifying sub-grades to the required depths; grading as required and compacting sub-grades to required densities; placing and compacting excavated material as backfill around structures. Where required and as directed; and all appurtenant work.
      - a. Dose not include Over-Excavation: Payment will not be made for over-excavated work or for replacement materials.
      - b. The Contractor shall examine existing conditions at the job site; and shall base his costs for structural excavation upon his own determinations of the amount of work to be done.

6. Supplying borrow material for backfill, if required; stockpiling material as directed; placing, shaping, and compacting material where required and as indicated; and all appurtenant work.
  - a. Borrow material placed outside the limits, as described herein and as directed by the City Inspector, shall be at the Contractors expense, will no additional cost to the City.
7. Furnishing, placing and compacting new gravel base, (4-inch thick) for the new curb and constructing new concrete curb and gutter or 8-inch thick for waterways and transition structures, including expansion joints and radius sections, of the type and size and to the limits indicated and as directed by the City Inspector.
8. Constructing new concrete sidewalk, including expansion joints, of the size and thickness, and to the limits indicated and as directed by the City Inspector.
9. Construction new ADA access ramps, on concrete curb and gutter, of the type, as indicated and as directed: including shaping back of curbs and shaping surfaces of sidewalks, at location of new ramp, where and as indicated on the drawings and as directed by City inspector; furnishing and installing detectable warning panels, as indicated; and all appurtenant work to complete the access ramps.
10. Constructing new waterways, to the thickness and widths indicated in APWA standards and as directed by City Inspector. This includes concrete testing, and rebar as specified in the plans and specifications.
11. Restoring landscaping along new sidewalks, as required and as directed: to include excavation, backfilling excavations, and compacting backfill; restoring all landscaping, including sprinklers systems items, lawn sod, shrubs and brushes, landscape items, fencing, street signs, and all related appurtenant items.

## **PART 2 PRODUCTS - NOT USED**

## **PART 3 EXECUTION - NOT USED**

**END OF SECTION**

## SECTION 02 41 14 PAVEMENT REMOVAL

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### PART 1 GENERAL

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#### 1.1. SECTION INCLUDES

- A. Remove roadway Pavement.
- B. Remove curb, gutter, sidewalk, Driveway Approach, waterway and similar flat work.

#### 1.2 MEASUREMENT PROCEDURES

- A. Double saw cutting required for pavement removal or T-patches will not be measured or paid for separately.

#### 1.3 REFERENCES

- A. **APWA (Utah) Standards:**  
Plan 256 Concrete pavement patch

#### 1.4 SUBMITTALS

- A. Traffic control plan, Section 01 55 26.

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### PART 2 PRODUCTS

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Not Used

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### PART 3 EXECUTION

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#### 3.1 PREPARATION

- A. Implement traffic control plan requirements, Section 01 55 26.
- B. Coordinate utility locations, Section 01 31 13.
- C. Preserve all active utilities.
- D. Notify neighborhood at least 48 hours before day and time of operation.
- E. Mark existing utilities on redline drawings.

#### 3.2 PROTECTION

- A. Install Invert Covers, Section 01 71 13.
- B. Trees:
  - 1. Avoid or minimize damage to trees and tree roots.
  - 2. Provide certified arborist observation of root cuts larger than four (4) inches diameter. Roots provide anchorage, storage of energy, and absorption and conduction of water and mineral elements. Loss of root connection affects health and stability of tree and safety of people and property. Notify ENGINEER of such root cut.

## C. Existing Surfaces:

1. Protect adjacent surfaces including concrete walls, planters, carriage walks, driveway approaches, rock walls, rock gardens concrete steps, sidewalks, and curb cut assemblies. Replace damaged facilities at no additional cost to OWNER.
2. Use rubber cleats or Pavement pads when operating backhoes, outriggers, track equipment, or any other equipment on or crossing paved surfaces.
3. Restore paved surfaces that are damaged by removal operations at no additional cost to the OWNER. Match the existing Pavement surface plus 1 inch.

## D. Environment:

1. Control dust, Section 01 57 00.
2. Protect plant and animal habitat. Follow federal, state or local protection requirements.

## E. Repair or replace any damage at no additional cost to OWNER.

**3.3 REMOVE PORTLAND CEMENT CONCRETE PAVEMENT**

## A. See APWA Plan 256 requirements.

## B. Cutting:

1. DO NOT use machine mounted impact hammers.
2. Make concrete cuts straight, vertical, true, full-depth.
3. Cut along perimeter of panel to be removed. Where edge of existing surface is cracked, broken, or deteriorated, make the cut so the defective surface can be removed.
4. Cut along any edge that is damaged during construction, including cavities underneath caused by construction or concrete removal.

## C. Removal:

1. Remove concrete to the nearest expansion joint or vertical saw cut.
2. Remove panels without damaging remaining panels.
3. Remove all bonding inhibitors.

**3.4 REMOVE BITUMINOUS CONCRETE PAVEMENT**

## A. Cutting:

1. Use any method that produces a true, vertical, full-depth cut.
2. When bituminous pavement overlays Portland cement concrete Pavement, DO NOT use machine mounted impact hammers.
3. If an edge of an existing surface is cracked, broken, or deteriorated, make the cut so the defective surface can be removed.
4. Re-cut along any edge that is damaged during construction, and where cavities underneath pavement are caused by construction.

## B. Remove Pavement: Remove pavement without damaging remaining.



**3.5 REMOVE CONCRETE FLAT WORK**

- A. Saw cut flat work at weakened plane joints. Saw cut full depth.
- B. Where edge of existing surface is cracked, broken, or deteriorated, make the cut so the defective surface can be removed.
- C. Saw along any edge that is damaged during construction, including cavities underneath caused by construction.
- D. If flat work that is not scheduled for removal is damaged, remove and replace the flat work at no additional cost to OWNER.

**3.6 CLEANING**

- A. Remove all debris and dust. Clean surrounding rails, sidewalks, Driveways, Driveway approaches, landscaping, concrete flat work, and other objects in vicinity of work.

END OF SECTION

## SECTION 02765

### PAVEMENT MARKING PAINT

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. Furnish Acrylic Water Based pavement marking paint. Refer to this Section, article 2.02, for resin requirement.
- B. Apply to existing roadway pavement as edge lines, center lines, broken lines, guidelines, contrast lines, symbols, and other related markings.
- C. Remove existing pavement markings.

##### 1.02 REFERENCES

- A. AASHTO M 247: Standard Specification for Glass Beads Used in Traffic Paints
- B. ASTM D 562: Standard Test Method for Consistency of Paints Measuring Krebs Unit (KU) Viscosity Using a Stormer-Type Viscometer
- C. ASTM D 2205: Standard Guide for Selection of Tests for Traffic Paints
- D. ASTM D 2743: Standard Practices for Uniformity of Traffic Paint Vehicle Solids by Spectroscopy and Gas Chromatography
- E. ASTM D 2805: Standard Test Method for Hiding Power of Paints by Reflectometry
- F. ASTM D 3723: Standard Test Method for Pigment Content of Water-Emulsion Paints by Low-Temperature Ashing
- G. ASTM D 3960: Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings
- H. ASTM D 4451: Standard Test Method for Pigment Content of Paints by Low-Temperature Ashing
- I. ASTM D 5381: Standard Guide for X-Ray Fluorescence (XRF) Spectroscopy of Pigments and Extenders
- J. ASTM E 1347: Standard Test Method for Color and Color-Difference Measurement by Tristimulus (Filter) Colorimetry
- K. Federal Standards
- L. Manual on Uniform Traffic Control Devices (MUTCD)
- M. UDOT Materials Manual of Instruction, Part 8
- N. UDOT Minimum Sampling and Testing Requirements
- O. Use the latest edition of the above reference standards as of the date of the project.

##### 1.03 DEFINITIONS

- A. Longitudinal Markings: Pavement markings that are generally placed parallel and adjacent to the flow of traffic, such as lane lines, center lines, edge lines, channelizing lines, and other related lines.

- B. Transverse Markings: Pavement markings that are generally placed perpendicular and across the flow of traffic, such as shoulder markings; word, symbol and arrow markings; stop lines; crosswalk lines; parking space markings; and other related lines.

#### 1.04 SUBMITTALS

- A. Documentation of the manufacturer and production batch identification for the paint used.

#### 1.05 ACCEPTANCE

- A. Provide fixtures such as ball valves, gate valves, or others on paint truck for the purposes of obtaining field samples.
- C. Agitate the paint to allow for thorough mixing. Follow paint manufacturer's recommendation for agitation and mixing times.
- D. Stop all agitation before sample is drawn.
- E. Calibrate all meters on the paint truck annually and certify for application rate verification.
  - 1. Use the following calibration tolerances for meters:
    - a. Paint:  $\pm 0.1$  gal
    - b. Beads:  $\pm 0.5$  lb/gal
  - 2. Keep a clean, legible copy of calibration report with the paint truck.
  - 3. Provide a copy of certification at the City Engineer's request.
- F. The City Engineer will:
  - 1. Visually inspect lines, legends, symbols, and messages to verify compliance with the required dimensions.
  - 2. Inspect at a minimum at the end of each production day.
  - 3. Verify quantities applied by either of the following methods:
    - a. Measuring both paint and bead tanks prior to and after application.
    - b. Witnessing the meter readings prior to and after application.
      - 1) A printout of meter readings, in lieu of witnessing, may be accepted at the City Engineer's discretion.
  - 4. Sample in accordance with the UDOT Materials Manual of Instruction, Part 8-932 and the UDOT Minimum Sampling and Testing Requirements.
- G. Repaint any line or legend failing to meet bead adherence and dimensional requirements.
- H. Price Reductions. When more than one of the requirements of the pavement markings is deficient, the result with the highest price reduction governs.
  - 1. Price reductions for pavement markings installed below the specified wet mil thickness are outlined in Table 1.

**Table 1**  
**Price Reduction for Wet Mil Thickness**

|  | Pay Factor |
|--|------------|
| At the specified mil thickness                             | 1.00       |
| 1-10 percent below the Specified wet mil thickness         | 0.75       |
| 11-15 percent below the Specified wet mil thickness        | 0.50       |
| More than 15 percent below the Specified wet mil thickness | 0.00 *     |

\* Repaint pavement markings at no cost to the Owner.

2. Price reductions for pavement markings installed below the specified total solids, pigment, and non-volatile vehicle content (shown in table 4) are outlined in Table 2.

**Table 2**

| <b>Price Reduction for Total Solids, Pigment and Non-Volatile Vehicle</b> |            |
|---|------------|
|   | Pay Factor |
| At or above the specified percentage                                      | 1.00       |
| Up to 0.5 percent below the specified percentage                          | 0.85       |
| 0.5 to 1.0 percent below the specified percentage                         | 0.70       |
| More than 1.0 percent below the specified percentage                      | 0.00 *     |

\* Repaint pavement markings at no cost to the Owner.

3. Price reductions for pavement markings that fail to meet the remaining requirements of Table 4 are outlined in Table 3.

**Table 3**

| <b>Price Reductions</b>                                       |            |
|---|------------|
|   | Pay Factor |
| At the specified requirements                                 | 1.00       |
| Up to 1 percent deficient                                     | 0.90       |
| 1 to 2 percent deficient                                      | 0.80       |
| 2 to 3 percent deficient                                      | 0.70       |
| 3 to 4 percent deficient                                      | 0.60       |
| 4 to 5 percent deficient                                      | 0.50       |
| More than 5 percent below specified quantitative requirements | 0.00 *     |

\* Repaint pavement markings at no cost to the Owner.

## **PART 2 PRODUCTS**

### **2.01 PAINT**

- A. Meet the requirements for Acrylic Water Based Paint as listed in Table 4:

**Table 4**

| <b>Paint Requirements</b>                                |            |            |            |                       |
|--|------------|------------|------------|-----------------------|
| Property   | White      | Yellow     | Black      | Test                  |
| Pigment: Percent by weight                               | 63.0       | 63.0       | 63.0       | ASTM D 3723           |
| Total Solids: Percent by weight, minimum                 | 79.0       | 79.0       | 79.0       | ASTM D 2205           |
| Nonvolatile vehicle: Percent by weight vehicle, minimum* | 43.0       | 43.0       | 43.0       | ASTM D 2205           |
| Viscosity, KU @ 77 degrees F                             | 80 – 95    | 80 - 95    | 80 - 95    | ASTM D 562            |
| Density, lb/gal  | 14.1 ± 0.3 | 14.1 ± 0.3 | 14.1 ± 0.3 | ASTM D 2205           |
| Volatile Organic Content (VOC): lb/gal, maximum          | 1.25       | 1.25       | 1.25       | ASTM D 3960           |
| Titanium Dioxide Content, lb/gal                         | 1.0 min    | 0.2 max    | N/A        | ASTM D 5381           |
| Color Definition   | 37875      | 33538      | N/A        | Federal Standard 595B |
| Directional Reflectance Minimum                          | 90.0       | 50.0       | N/A        | ASTM E 1347           |
| Dry Opacity: Minimum (5 mils wet)                        | 0.95       | 0.95       | N/A        | ASTM D 2805           |

\* Binder: 100 percent acrylic cross-linking polymer, by weight, as determined by infrared analysis and other chemical analysis available to UDOT. Refer to ASTM D 2205.

B. No-Pick-Up Time

1. Paint may not smear or track three minutes after application to the roadway using standard application equipment, at the mil thickness required, and with an ambient shaded temperature of at least 50 degrees F.

C. Additional requirements:

1. Free of lead, chromium, or other related heavy metals. Refer to ASTM D 5381.
2. Refer to ASTM D 2743, ASTM D 4451 and ASTM D 5381: Tests used to verify paint samples meet ASTM requirements.

## 2.02 GLASS SPHERES (BEADS) USED IN PAVEMENT MARKING PAINT

A. Specific Properties: Meet AASHTO M 247 with the following exceptions.

1. Gradation:

|                      |                  |
|----------------------|------------------|
| Passing No. 14 sieve | 95 - 100 percent |
| Passing No. 16 sieve | 80 - 95 percent  |
| Passing No. 18 sieve | 10 - 40 percent  |
| Passing No. 20 sieve | 0 - 5 percent    |
| Passing No. 25 sieve | 0 - 2 percent    |

2. Beads: Silane adhesion coating.

3. Roundness - The glass beads will have a minimum of 80 percent true spheres.

B. Beads used in Temporary Pavement Markings meet the above or AASHTO M 247 Type II uniform gradation.

## PART 3 EXECUTION

### 3.01 GENERAL

A. The general striping plan and markings, for each street to be striped, will match the existing striping plan and markings, as indicated and as directed by the City Inspector.

1. The striping and markings shall include 4-inch wide white solid and dashed lines, and 4-inch wide yellow solid and dashed lines, for traffic lanes and bike lanes; 8-inch white solid lines for stop bars and crosswalks; paint for City standard 3-D crosswalks; all markings and symbols matching existing as per types and sizes, as directed; and all appurtenant work to complete the striping and markings for each street.
2. Before striping layout, the Contractor shall examine each street with the City Inspector to determine how the layout shall be done on each street to maintain the existing number of traffic lanes, bike lanes, and related items.

### 3.02 PREPARATION

A. Line Control.

1. Establish control points at 100 foot intervals on tangent and at 50 foot intervals on curves.
2. Maintain the line within 2 inches of the established control points and mark the roadway between control points as needed.
  - a. Remove paint that is not placed within tolerance of the established control points and replace at no expense to the Owner. Refer to this Section, article 3.4.
  - b. Maintain the line dimension within 10 percent of the width and length dimensions defined in Standard Drawings.

- B. Remove dirt, loose aggregate and other foreign material and follow manufacturer's recommendations for surface preparation.

### **3.03 APPLICATION**

- A. Apply Pavement marking paint at the following wet mil thickness requirements.
  - 1. 20 – 25 wet mils for all longitudinal markings.
    - a. Example Calculation: (Verify wet mil thickness)  
$$\text{Wet Mils} = (0.133681 \text{ ft}^3/\text{gal}) * 12000 \text{ mil/ft} / (X \text{ ft/gal})(Z \text{ ft})$$

Where  
X = application rate. (Meter readings or dipping tanks).  
Z = line width measured in feet.  
12000 = conversion from feet to mil; 0.133681 = conversion from gallons to cubic feet.
    - b. For information only: Approximate application rate for required mil thickness requirements.
      - 1) 4 inch Solid Line: From 190 to 240 ft/gal
      - 2) 4 inch Broken Line: From 760 to 960 ft/gal
      - 3) 8 inch Solid Line: From 95 to 120 ft/gal
  - 2. 23 – 40 wet mils for all painted legends as determined by a wet mil gauge.
- B. Refer to Table 1 for pavement markings that are less than required wet mils in thickness.
- C. No additional payment for pavement markings placed in excess of required wet mils in thickness or exceeding dimensional requirements outlined in this Section, article 3.1 paragraph A.
- D. Glass Sphere (Beads): Apply a minimum of 8 lb/gal of paint, the full length and width of line and pavement markings.
  - 1. Do not apply glass beads to contrast lines (black paint).
- E. Begin striping operations no later than 24 hours after ordered by the City Engineer.
- F. At time of application apply lines and pavement markings only when the air and pavement temperature are:
  - 1. 50 degrees F and rising for Acrylic Water Based Paint.
- G. Comply with U.D.O.T. TC Series Standard Drawings.

### **3.04 CONTRACTOR QUALITY CONTROL**

- A. Application Rate: Verify that the paint and beads are being applied within specified tolerances prior to striping.
- B. Curing: Protect the markings until dry or cured. In the event that the uncured marking is damaged the marking will be reapplied and track marks left on the pavement will be removed at no additional cost to the Owner.

### **3.05 REMOVE PAVEMENT MARKINGS**

- A. Use one of these removal methods:
  - 1. High pressure water spray,
  - 2. Sand blasting,
  - 3. Shot blasting,
  - 4. Grinding. Grinding is not allowed on the final surfacing unless the City Engineer grants prior written approval.

- B. Do not eliminate or obscure existing striping, in lieu of removal, by covering with black paint or any other covering.
  - 1. The City Engineer may grant prior written approval for use of black paint or other obscuring material for work durations shorter than “long term stationary” as defined in the Temporary Traffic Control section of the MUTCD.
- C. Use equipment specifically designed for removal of pavement marking material.

**END OF SECTION**

**SECTION 32 11 23**  
**AGGREGATE BASE COURSES**

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**PART 1 GENERAL**

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**1.1 SECTION INCLUDES**

- A. Treated and untreated base course production and placement.

**1.2 REFERENCES****A. AASHTO Standards:**

- R9 Acceptance Sampling Plans for Highway Construction.

**B. ASTM Standards:**

- C29 Unit Weight and Voids in Aggregate.
- C131 Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
- C117 Materials Finer Than 0.075mm (No. 200) Sieve in Mineral Aggregates by Washing.
- C136 Sieve Analysis of Fine and Coarse Aggregates.
- D75 Sampling Aggregates.
- D448 Sizes of Aggregate for Road and Bridge Construction.
- D1557 Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup> (2,700 kN-m/m<sup>3</sup>)).
- D1883 CBR (California Bearing Ratio) of Laboratory-Compacted Soils.
- D2216 Laboratory Determinations of Water (Moisture) Content of Soil and Rock.
- D2419 Sand Equivalent Value of Soils and Fine Aggregate.
- D2922 Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- D3017 Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
- D3665 Random Sampling of Construction Materials.
- D3740 Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
- D4318 Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- D5821 Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate.



### 1.3 DEFINITIONS

- A. **Master Grading Band:** A graphical area defined by gradation limits allowed for various sieve sizes ranging from the maximum sieve size to the No. 200 sieve.
- B. **Target Grading Curve:** A smooth locus of points within the limits of the Master Grading Band.
- C. **Target Grading Band:** Gradation limits defined by the allowable variance from the Target Grading Curve. It is possible that these limits may lie outside of the Master Grading Band.
- D. **Mean of Deviations:** The sum of the absolute values of the variance between each screen target value and each measured value divided by the number of tests in the Lot.
- E. **RAP:** Acronym for reclaimed asphalt pavement. See Section 32 12 16.18.
- F. **Lot:** (a) Quantity of aggregate delivered to a site when considering gradation, (b) area of aggregate placed at a site when considering density.

### 1.4 SUBMITTALS

- A. **Mix Design:** Provide the following. Allow ENGINEER 10 days to evaluate the submittal.
  - 1. Date of mix design. If older than 365 days from date of submission, recertify mix design.
  - 2. Name of supplier and aggregate source.
  - 3. Target gradation for each sieve size,
  - 4. Percent composition of reclaimed asphalt or concrete included in the mix.
  - 5. Unit weight, CBR, relative density, and relative moisture content.
  - 6. Aggregate physical properties (this section article 2.1). The information is for suitability of source and not for project control. A new report may be required if aggregate source is changed. Test results shall not be older than 455 days from date of submission.
- B. **At Delivery:** Submit batch delivery ticket identifying serial number of ticket, date and truck number, job name, weight of aggregate, mix identification, and description.

### 1.5 QUALITY ASSURANCE

- A. Do not change aggregate source until ENGINEER accepts new source and new mix design.
- B. Use a laboratory that follows and complies with ASTM D3740 and Section 01 45 00 requirements.
- C. If requested, submit a quality control and testing report describing source and field quality assurance activities performed by CONTRACTOR and Suppliers.

## 1.6 ACCEPTANCE

### A. General:

1. Acceptance is by Lot.
2. If non-complying material has been installed and no price for the material is specified, apply pay adjustment against cost of work requiring complying material as part of its installation, Section 01 29 00.
3. ENGINEER is not obligated to accept changes in gradation target after any material is delivered to site.
4. Observation of CONTRACTOR's field quality control testing does not constitute acceptance. Such testing; however, may be used by ENGINEER for acceptance if requirements in Section 01 35 10 are met.
5. Dispute resolution, Section 01 35 10.

- B. **Gradation:** Lot size is one (1) day production. Sub-lot size is 500 tons. Collect samples from grade before compaction. Conduct at least one (1) gradation analysis for each lot. Lot is acceptable if gradation test deviations are within pay factor 1.00 limits. At ENGINEER's discretion, a lot with a sub-lot deviation greater than pay factor 0.70 limits may stay in place at 50 percent pay.

| Table 1- Gradation Pay Factors |            |   |             |             |             |                   |
|--------------------------------|------------|---|-------------|-------------|-------------|-------------------|
| Criteria                       | Pay Factor | Mean of Deviations of Acceptance Tests From the Target Grading Curve Expressed in Percentage Points |             |             |             |                   |
|                                |            | 1 Sample  | 2 Samples   | 3 Sample    | 4 Sample    | 5 or More Samples |
| 1/2" and Larger Sieves         | 1.00       | 0 – 15  | 0.0 – 12.1  | 0.0 – 10.8  | 0.0 – 10.0  | 0.0 – 9.5         |
|                                | 0.95       | 16 – 17   | 12.2 – 13.9 | 10.9 – 12.4 | 10.1 – 11.5 | 9.6 – 11.         |
|                                | 0.90       | 18 – 19   | 14.0 – 15.1 | 12.5 – 13.5 | 11.6 – 12.5 | 11.1 – 11.9       |
|                                | 0.80       | 20 – 21   | 15.2 – 17.2 | 13.6 – 15.3 | 12.6 – 14.2 | 12. – 13.5        |
|                                | 0.70       | 22 – 23   | 17.3 – 18.8 | 15.4 – 16.7 | 14.3 – 15.5 | 13.6 – 14.7       |
| 3/8" Sieve                     | 1.00       | 0 – 15  | 0.0 – 11.5  | 0.0 – 9.8   | 0.0 – 8.8   | 0.0 – 8.0         |
|                                | 0.95       | 16 – 17   | 11.6 – 13.2 | 9.9 – 11.3  | 8.9 – 10.1  | 8.1 – 9.2         |
|                                | 0.90       | 18 – 19   | 13.3 – 14.4 | 11.4 – 12.3 | 10.2 – 11   | 9.3 – 10.0        |
|                                | 0.80       | 20 – 21   | 14.5 – 16.3 | 12.4 – 13.9 | 11.1 – 12.5 | 10.1 – 22.4       |
|                                | 0.70       | 22 – 23   | 16.4 – 17.9 | 14.0 – 15.2 | 12.6 – 13.6 | 11.5 – 12.4       |
| No. 4 Sieve                    | 1.00       | 0 – 14  | 0.0 – 10.5  | 0.0 – 8.8   | 0.0 – 7.8   | 0.0 – 7.0         |
|                                | 0.95       | 15 – 17   | 10.6 – 12.1 | 8.9 – 10.1  | 7.9 – 9.0   | 7.1 – 8.0         |
|                                | 0.90       | 18  | 12.2 – 13.1 | 10.2 – 11   | 9.1 – 9.8   | 8.1 – 8.7         |
|                                | 0.80       | 19 – 20   | 13.2 – 14.9 | 11.1 – 12.5 | 9.9 – 11.1  | 8.8 – 10.0        |
|                                | 0.70       | 21 – 22   | 15.0 – 16.3 | 12.6 – 13.6 | 11.2 – 12.1 | 10.1 – 10.8       |
| No. 16 Sieve                   | 1.00       | 0 – 11  | 0.0 – 8.2   | 0.0 – 6.9   | 0.0 – 6.2   | 0.0 – 5.6         |
|                                | 0.95       | 12 – 13   | 8.3 – 9.4   | 7.0 – 7.9   | 6.3 – 7.1   | 5.7 – 6.4         |
|                                | 0.90       | 14  | 9.5 – 10.3  | 8.0 – 8.6   | 7.2 – 7.8   | 6.5 – 7.0         |
|                                | 0.80       | 15 – 16   | 10.4 – 11.6 | 8.7 – 9.8   | 7.9 – 8.8   | 7.1 – 8.0         |
|                                | 0.70       | 17  | 11.7 – 12.7 | 9.9 – 10.7  | 8.9 – 9.6   | 8.1 – 8.7         |

|                  |      |           |           |           |           |           |
|------------------|------|-----------|-----------|-----------|-----------|-----------|
| No. 200<br>Sieve | 1.00 | 0 – 4.5   | 0.0 – 3.4 | 0.0 – 2.9 | 0.0 – 2.5 | 0.0 – 2.3 |
|                  | 0.95 | 4.6 – 5.2 | 3.5 – 3.9 | 3.0 – 3.3 | 2.6 – 2.9 | 2.4 – 2.6 |
|                  | 0.90 | 5.3 – 5.6 | 4.0 – 4.3 | 3.4 – 3.6 | 3.0 – 3.1 | 2.7 – 2.9 |
|                  | 0.80 | 5.7 – 6.4 | 4.4 – 4.9 | 3.7 – 4.1 | 3.2 – 3.6 | 3.0 – 3.3 |
|                  | 0.70 | 6.5 – 7.0 | 4.9 – 5.3 | 4.2 – 4.5 | 3.7 – 3.9 | 3.5 – 3.6 |

**NOTES**

(a) ENGINEER has 36 hours after Lot placement to accept aggregate gradation. CONTRACTOR may place material over the crushed aggregate base material during the 36 hours interval at its own risk. Pay factors for the Lot will NOT be applicable if ENGINEER performs tests after the 36 hours interval.

- C. **Relative Density:** Lot size 10,000 cubic yards. Conduct at least one laboratory determination to be used as a standard for field density and field moisture content determinations.
- D. **Field Density:** Lot size is one (1) day placement. Number of density tests varies according to placement type, location and sub-lot size (Table 2). Conduct at least one (1) field density test in the lot. Select each test location randomly.

| Table 2 - Placement Type, Location, Sub-lot Size |   |                    |
|--|---|--------------------|
| Type   | Location  | Sub-lot Size       |
| I  | Pavement (includes curb, gutter and water way when in conjunction with pavement placement). | 1,000 square yards |
| II   | Curb, gutter, waterway  | 200 linear feet    |
|  | Sidewalk  | 400 linear feet    |
|  | Driveway approach, curb cut assembly, waterway transition structure, flat work              | 400 square feet    |
| III  | Landscaping and other non-structural, non- load bearing areas                               | --                 |

## PART 2 PRODUCTS

### 2.1 UNTREATED BASE COURSE

- A. **Material:** Crushed rock, gravel, sand, or other high quality mineral particle, or combination that is free of organic matter, free of chemical or petroleum contamination, and meets the following physical properties.

| Table 3 – Untreated Base Course Physical Properties   |        |                 |    |    |
|---|--------|-----------------|----|----|
|   | ASTMs  | Aggregate Class |    |    |
|   |        | A               | B  | C  |
| Coarse aggregate  |        |                 |    |    |
| Angularity (2 fractured faces), min., percent   | D5821  | 50              | –  | –  |
| Wear (toughness or hardness), max., percent   | C131   | 50              |    |    |
| Fine aggregate  |        |                 |    |    |
| Liquid Limit, max.  | D4318  | 25              |    |    |
| Plastic Index, max.   | D4318  | 0               | 0  | 6  |
| Sand Equivalent, min., percent  | D24 19 | 35              |    |    |
| Blended aggregate   |        |                 |    |    |
| Dry Rodded Unit Weight, min., percent   | C29    | 75              |    |    |
| CBR, min., percent  | D1883  | 70              | 55 | -- |
| NOTES   |        |                 |    |    |
| (a) Faces: Retained on No. 4 sieve.   |        |                 |    |    |
| (b) Wear: Retained on No. 12 sieve after 500 revolutions.   |        |                 |    |    |
| (c) Liquid limit and plastic index: Passing No. 40 sieve.   |        |                 |    |    |
| (d) Sand equivalent (clay content or cleanliness): Passing No. 4 sieve.   |        |                 |    |    |
| (e) CBR: Use a surcharge of 10 pounds measured at 0.20 inch penetration at 95 percent relative to a modified proctor density. A reduction in aggregate class may be accepted providing any costs for difference in excavation, backfill, and alternate design for CBR does not increase Concrete Price. |        |                 |    |    |

- B. **Gradation:** Analyzed according to ASTM C136 on a dry weight and percent passing basis. Target Grading Curve must lie within the selected aggregate grade in table 4. Field gradation shall not vary from target by more than the target tolerance.

| Table 4 – Master Grading Bands  |                 |         |           |                                 |
|---|-----------------|---------|-----------|---------------------------------|
| Sieve   | Aggregate Grade |         |           | Target Tolerance                |
|   | Grade 1-1/2     | Grade 1 | Grade 3/4 |                                 |
| 1-1/2"  | 100             | –       | –         | (Pay factor 1.00<br>in Table 1) |
| 1 "   | –               | 100     | –         |                                 |
| 3/4 "   | 70 – 85         | –       | 100       |                                 |
| 1/2 "   | –               | 79 – 91 | –         |                                 |
| 3/8 "   | 55 – 75         | –       | 78 – 92   |                                 |
| No. 4   | 40 – 65         | 49 – 61 | 55 – 67   |                                 |
| No. 16  | 25 – 40         | 27 – 35 | 28 – 38   |                                 |
| No. 200   | 7 – 11          | 7 – 11  | 7 – 11    |                                 |
| NOTES   |                 |         |           |                                 |
| (a) It is assumed fine and course aggregate have same bulk specific gravity.                |                 |         |           |                                 |
| (b) Target tolerance for 3/4 sieve in Grade 3/4, and 1” sieve in Grade 1 is not applicable. |                 |         |           |                                 |
| (c) Percentage of fines passing No. 200 sieve determined by washing, ASTM C117.             |                 |         |           |                                 |

- C. **Changing Source:** A new material properties report is required.

## 2.2 TREATED BASE COURSE

- A. Treatment includes addition of lime, cement slurry, asphalt emulsion, RAP, crushed concrete, or any combination, or other material acceptable to ENGINEER.
- B. Base course containing RAP:
1. Meet requirements of this section article 2.1 and the following:
    - a. Sand equivalent and fractured face measured after asphalt residue is burned off.
    - b. Plasticity and wear requirements apply to virgin aggregate portion only.
    - c. Allowable asphalt content is controlled by allowable CBR.
  2. Remove debris from crushed RAP aggregate by screening.
  3. Mechanically blend virgin and RAP aggregates. Do not use windrows for blending.
- C. Base course containing crushed concrete.
1. Meet requirements of this section article 2.1 and the following:
    - a. Cement with its chemical components is allowed.
    - b. Wear test and fractured face test not required.

## 2.3 SOURCE QUALITY CONTROL

- A. Reject crushed aggregate base products that do not meet requirements of this Section.
- B. Sampling Protocol: Random location selection, ASTM D3665. Sample collection, ASTM D75.
- C. Testing Protocol: Gradation, ASTM C136. Maximum density, ASTM D1557. Optimum moisture content, ASTM D2216.

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## PART 3 EXECUTION

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### 3.1 SUB-BASE PREPARATION

- A. Trenches, Section 33 05 20.
- B. Structures, Section 31 23 23.
- C. Landscaping, Section 32 91 19.
- D. Pavements, Section 32 05 10.

### 3.2 PLACEMENT

- A. General:
1. Place uniform lifts not exceeding eight (8) inches before compaction.
  2. Maintain optimum moisture content plus or minus two (2) percent.

3. Use appropriate compaction equipment.
  4. Do not place additional material on any unaccepted layer or on any frozen surface.
- B. Provide aggregate suitable for the following locations.

| <b>Table 5 - Placement Type, Location, Aggregate Class</b> |   |                        |          |          |
|--|---|------------------------|----------|----------|
| <b>Type</b>  | <b>Location</b>   | <b>Aggregate Class</b> |          |          |
|  |   | <b>A</b>               | <b>B</b> | <b>C</b> |
| I  | Pavement (includes curb, gutter and waterway when in conjunction with pavement placement)                 | <b>X</b>               |          |          |
| II   | Concrete flat work (includes driveway approach, curb cut assembly, curb, gutter, sidewalk, waterway, etc. | <b>X</b>               | <b>X</b> |          |
| III  | Landscape (includes non-structural, non-load bearing areas.   | <b>X</b>               | <b>X</b> | <b>X</b> |
| NOTES:   |   |                        |          |          |
| (a) <b>X</b> indicates where placement is allowed.         |   |                        |          |          |

- C. Compaction:
1. Type I and Type II Placement: 95 percent minimum.
  2. Type III Placement: Suitable to overlying surface, or installation, or use. Verify compactive effort with ENGINEER.
- D. Finish: Uniform with surface deviation no more than 3/8 of an inch from line and grade in 10 feet in any direction.

### 3.3 FIELD QUALITY CONTROL

- A. Sampling Protocol: Random location selection, ASTM D3665. Sample collection, ASTM D75.
- B. Testing Protocol: Gradation, ASTM C136. Field density, ASTM D2922. Moisture content, ASTM D3017.

### 3.4 REPAIR OR REMOVAL

- A. If product is correctable and at no additional cost to OWNER, provide laboratory data showing design CBR has not been reduced and material in-place has been compacted to 97 percent minimum.
- B. Remove any product that cannot be corrected and install acceptable product at no additional cost to OWNER.

END OF SECTION

## SECTION 32 12 03 ASPHALT BINDERS

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### PART 1 GENERAL

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#### 1.1 SECTION INCLUDES

- A. An asphalt-based cement that is produced from petroleum residue either with or without the addition of non-particulate, non-fibrous organic modifiers.
- B. Requirements for accepting non-complying Asphalt Binders.

#### 1.2 REFERENCES

- A. **ASTM Standards:**
  - D113 Ductility of Bituminous Materials.
  - D977 Emulsified Asphalt.
  - D2026 Cutback Asphalt (Slow-Curing Type).
  - D2027 Cutback Asphalt (Medium-Curing Type).
  - D2028 Cutback Asphalt (Rapid-Curing Type).
  - D2397 Cationic Emulsified Asphalt.
  - D3381 Viscosity-Graded Asphalt Cement for Use in Pavement Construction.
  - D4552 Classifying Hot-Mix Recycling Agents.
  - D5710 Trinidad Lake Modified Asphalt.
  - D6373 Performance Graded Asphalt Binder.

#### 1.3 SUBMITTALS

- A. Submit bill of lading for each shipment of Asphalt Binder from vendor. Identify the following:
  - 1. Source of product (manufacturer);
  - 2. Type and grade of asphalt, and
  - 3. Type and amount of additives in the product.

#### 1.4 QUALITY ASSURANCE

- A. Reject Asphalt Binders that are not uniform in appearance and consistency or foams at hot mixing temperature.
- B. Do not use storage containers contaminated with other types or grades of petroleum products.
- C. Do not use petroleum product that does not comply with contract requirements.

## 1.5 ACCEPTANCE

### A. General:

1. Acceptance is by Lot. One (1) Lot is one (1) day production.
2. If non-complying material has been installed and no price for the material is specified, apply pay adjustment against cost of work requiring material as part of its installation. Section 01 29 00
3. Dispute resolution, Section 01 35 10.

### B. Performance Graded Asphalt Binder (PGAB):

Sub-lot size is 20,000 gallons. Collect sub-lot Samples randomly from oil storage unit.

1. Meet limits published in Section 209 of UDOT's "Manual of Instruction, Part 8 Materials". Pay reductions are as follows:
  - a. If none of the critical properties are outside rejection limit a composite pay adjustment of 25 percent or less is allowed.
  - b. If one or more of the critical properties falls outside the rejection limit or if a composite pay adjustment is more than 25 percent, Asphalt Binder will be rejected.

### C. Asphalt Cement (AC) Binder:

Sub-lot size is 20,000 gallons. Collect sub-lot Samples randomly from oil storage unit.

1. Ductility: Meet this section's requirements, or
2. Viscosity or Penetration: Meet graphics published in Section 955 of UDOT's "Manual of Instructions, Part 8 Materials":
  - a. Lot may be accepted using the published graphics. If pay adjustment exceeds 30 percent, reject Asphalt Binder, or
  - b. If allowed to remain after placement, pay adjustment will be 50 percent.

### D. Cut-back Binder:

Meet this section's requirements for ductility.

### E. Trinidad Lake Modified Asphalt:

Supplier's certificate for ASTM compliance.

### F. Emulsified Asphalt:

Supplier's certificate for ASTM compliance.

### G. Recycle Asphalt:

Identity of source (asphalt cement or tar products).

### H. Crack Patch:

Meet material requirements in Section 32 01 17.

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## PART 2 PRODUCTS

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### 2.1 PERFORMANCE GRADE ASPHALT BINDER (PGAB)

- A. Petroleum asphalt that complies with ASTM D6373. Blending binder with polymers, crumb rubber, or natural bitumens is CONTRACTOR's choice.

### 2.2 ASPHALT CEMENT (AC)

- A. Petroleum asphalt that complies with Table 2 of ASTM D3381 except as follows:



1. Replace ductility, ASTM D113, at 77 deg F (25 deg. C) with ductility at 39.2 deg F (4 deg. C). Use the following values.
    - AC-5: greater than 25.
    - AC-10: greater than 15.
    - AC-20: greater than 5.
  2. Delete the loss on heating requirement on residue from "Thin-Film Oven Test".
- B. AC-5 Latex Additive: Anionic emulsion of butadiene-styrene low-temperature copolymer consisting of two (2) percent by weight (solids basis), stabilized with fatty-acid soap for storage stability.
- 2.3 TRINIDAD LAKE MODIFIED ASPHALT (TLA)**
- A. Petroleum asphalt that complies with ASTM D5710 (a blend of natural bitumens).
- 2.4 SLOW CURE CUT-BACK ASPHALT (SC)**
- A. Petroleum asphalt that complies with ASTM D2026 (fluxed with a light oil) except if penetration of residue is more than 200 and its ductility at 77 deg. F (25 deg. C) is less than 100 cm., the material will be acceptable if the ductility at 59 deg F (15 deg. C) is greater than 100.
- 2.5 MEDIUM CURE CUT-BACK ASPHALT (MC)**
- A. Petroleum asphalt that complies with ASTM D2027 (fluxed or blended with a kerosene type solvent, non-foaming when heated to application temperature) except if penetration of residue is more than 200 and its ductility at 77 deg F (25 deg. C) is less than 100 cm., the material will be acceptable if the ductility at 59 deg F (15 deg. C) is greater than 100.
- 2.6 RAPID CURE CUT-BACK ASPHALT (RC)**
- A. Petroleum that complies with ASTM D2028 asphalt (fluxed or blended with a naphtha solvent, non-foaming when heated to application temperature).
- 2.7 EMULSIFIED ASPHALT**
- A. Petroleum asphalt uniformly emulsified with water, homogeneous throughout, and when stored, shows no separation within 30 days after delivery. Frozen emulsions not accepted:
1. Anionic, ASTM D977 (breaks by evaporation).
  2. Cationic, ASTM D2397 (breaks chemically).
- 2.8 RECYCLE ASPHALT (RA)**
- A. Petroleum asphalt that complies with ASTM D4552 (homogeneous, free-flowing at pumping temperature made from maltene fractions of asphalt cement for surface revitalization or from tar products to make Pavements resistant to fuel spillage:
1. RA-1, RA-5, RA-25 or RA-75 for recycling RAP aggregate when less than 30 percent virgin aggregate is added.
  2. RA-250 or RA-500 when more than 30 percent virgin aggregate is added to RAP.

**2.9 WARM-MIX ASPHALT (WMA)**

- A. Performance grade Asphalt Binder or asphalt cement binder blended with a wax, foam, chemical, or organic additive.

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**PART 3 EXECUTION**

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**3.1 INSTALLATION**

- A. Prime coat, Section 32 12 13.19.
- B. Tack coat, Section 32 12 13.13.
- C. Plant mix paving, Section 32 12 16.13.
- D. Road mix paving, Section 32 12 16.19.
- E. Slurry seal coating, Section 32 01 13.61.
- F. Crack sealing, Section 32 01 17.

END OF SECTION

**SECTION 32 12 05**  
**BITUMINOUS CONCRETE**

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**PART 1 GENERAL**

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**1.1 SECTION INCLUDES**

- A. Composition of a bituminous concrete mix.

**1.2 REFERENCES**

**A. AASHTO Standards:**

- M323 Superpave Volumetric Mix Design, Single User Digital Publication
- R30 Mixture Conditioning of Hot-Mix Asphalt (HMA)
- T324 Hamburg Wheel-Track Testing of Compacted Hot-Mix Asphalt (HMA)

**B. AI Standards:**

- MS-2 Asphalt Mix Design Methods.

**C. ASTM Standards:**

- C29 Unit Weight and Voids in Aggregate.
- C88 Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
- C117 Materials Finer Than 0.075mm (No. 200) Sieve in Mineral Aggregates by Washing.
- C131 Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
- C136 Standard Method for Sieve Analysis of Fine and Coarse Aggregate.
- C142 Clay Lumps and Friable Particles in Aggregates.
- D75 Sampling Aggregates.
- D140 Sampling Bituminous Materials.
- D242 Mineral Filler for Bituminous Paving Mixtures.
- D979 Sampling Bituminous Paving Mixtures.
- D995 Mixing Plants for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures.
- D2041 Theoretical Maximum Specific Gravity of Bituminous Paving Mixtures.
- D2419 Sand Equivalent Value of Soils and Fine Aggregate.
- D3203 Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures.
- D3515 Hot-Mixed, Hot-Laid Bituminous Paving Mixtures.

- D3665 Random Sampling of Construction Materials.
- D3666 Minimum Requirements for Agencies Testing and Inspecting Bituminous Paving Materials.
- D4318 Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- D4552 Classifying Hot-Mix Recycling Agents.
- D4791 Flat or Elongated Particles in Coarse Aggregate.
- D4867 Effect of Moisture on Asphalt Concrete Paving Mixtures.
- D5444 Mechanical Size Analysis of Extracted Aggregate.
- D5821 Determining the Percentage of Fractured Particles in Coarse Aggregate.
- D6307 Determining Asphalt Content of Hot-Mix Asphalt by Ignition Method.
- D6373 Performance Graded Asphalt Binder.
- D6927 Marshall Stability and Flow of Bituminous Mixtures.

### 1.3 DEFINITIONS

- A. **Mix Designator:** An alphanumeric code that identifies binder grade, aggregate grade, and compaction level for a bituminous concrete mix. For example.
  - *PG70-28, SP-1, 75Nd:* PG70-28 is a Performance Graded Asphalt Binder. SP-1 is the aggregate grade. 75Nd is the compaction level at Superpave mix design.
  - *OS/PG, SP-3/4, 75Nd:* OS/PG is a Blended Binder. SP-3/4 is the aggregate grade. 75ND is the compaction level at Superpave mix design.
  - *PG64-22, DM-1/2, 50 blow:* PG64-22 is a Performance Graded Asphalt Binder. DM-1/2 is the aggregate grade. 50 blow is the compaction level at Marshall mix design.
  - *OS/PG, DM-3/4, 50 blow:* OS/PG is a Blended Binder. DM-3/4 is the aggregate grade. 50 blow is the compaction level at Marshall mix design.
- B. **Bituminous Binder:** A cement composed of any of several viscous or solid mixtures of hydrocarbons and their nitrogen and sulfur derivatives.
  1. Asphalt Binder: A refined or manufactured bituminous cement known as performance graded asphalt binder (PG or PGAB) whether virgin or contained in RAP.
  2. Bitumen Binder: A natural bituminous cement contained in an Oil Sand (OS) or contained in a ROSP.
  3. Blended Binder: A Mixture of Asphalt Binder and Bitumen Binder.
- C. **Mean of Deviations:** Defined in Section 32 11 23.
- D. **Nominal Maximum Size:** One sieve size larger than first sieve size retaining more than 10 percent of the Sample. One hundred percent of the aggregate might be able to pass through the nominal maximum size sieve but not more than 10 percent will be retained on that sieve. The maximum size sieve will be one (1) sieve size larger than the nominal

maximum size.

- E. **Oil Sand (OS):** Naturally occurring sediments or sedimentary rock containing gravel, sand, clay, water and bituminous cement.
- F. **RAP:** Acronym for reclaimed asphalt pavement. A granular product recovered from a bituminous pavement containing aggregate and an Asphalt Binder.
- G. **ROSP:** Acronym for reclaimed Oil Sand pavement. A granular product recovered from a bituminous pavement containing aggregate and a Bitumen Binder.

#### 1.4 SUBMITTALS

##### A. General:

- 1. Pre-approved Mix Design: Submit name and address of Supplier.
- 2. Allow ENGINEER 10 days to evaluate mixing equipment and mix design submittals.
- 3. Once a mix design is accepted, a new mix design submittal is required if the following occurs.
  - a. Asphalt Binder grade is changed.
  - b. Aggregate source is changed. When this occurs, submit a physical properties report on the proposed aggregates.

##### B. Quality Assurance:

- 1. Independent Laboratory: Submit names, certification levels, and years of experience of testing agency's field technicians that are assigned to the Work. Verify laboratory complies with ASTM D3666. and follows Section 01 45 00 requirements.
- 2. Mix Production Equipment: Submit verification by an individual acceptable to ENGINEER, that plant equipment complies with requirements of ASTM D995.
- 3. Testing Report: If requested by ENGINEER, submit a report of source and field quality control testing performed by CONTRACTOR and Suppliers.

##### C. Mix Design: Submit the following.

- 1. Date of mix design. If the date exceeds the following times, the mix design is invalid and must be redesigned.
  - a. One (1) year for non-commercial plants.
  - b. Two (2) years for commercial plants if there is no change in the aggregate source. A new mix design will be required if aggregate source is changed.
- 2. Binder source, type, and grade. Disclose if RAP or ROSP is used in the mix.
- 3. Optimum compaction temperature at the project site.
- 4. Theoretical maximum specific gravity.
- 5. Compaction density at design target air voids.
- 6. Target Grading Curve for aggregate.

7. Binder target percentage, dust to binder ratio, and the following as applicable.
  - a. For Superpave mix design provide 1) voids in the mineral aggregate (VMA), and 2) voids filled with Bituminous Binder also known as VFA, and 3) Hamburg Wheel Tracker results.
  - b. For Marshall mix design provide 1) tensile strength ratio (moisture sensitivity), 2) voids in the mineral aggregate (VMA), 3) stability, 4) flow and 5) voids in the bituminous mix, and 6) voids filled with Bituminous Binder also known as VFA.
8. Percentages of 1) mineral filler, 2) anti-strip, 3) reclaimed bituminous pavement (RAP or ROSP), 4) recycle agent in the mix, and 5) virgin aggregate.
9. Aggregate physical properties (this section article 2.2). The information is for suitability of source and not for project control. A new report may be required if aggregate source is changed. Test results shall not be older than two (2) calendar years from the date of submission.

### 1.5 QUALITY ASSURANCE

- A. Do not change aggregate source or binder source until ENGINEER accepts new sources and mix design.

### 1.6 ACCEPTANCE

#### A. General:

1. Acceptance is by Lot. One (1) Lot is one (1) days' production.
2. If non-complying material has been installed and no price for the material is specified, apply pay adjustment against cost of work requiring material as part of its installation, Section 01 29 00.
3. If test results are not within this section's limits, options include correction of production procedures or production of an alternate mix design acceptable to ENGINEER.
4. Observation of CONTRACTOR's field quality control testing does not constitute acceptance. Such testing; however, may be used by ENGINEER for acceptance if requirements in Section 01 35 10 are met.
5. Dispute resolution, Section 01 35 10.

#### B. Mix Sampling and Testing:

1. Sub-lot size is 500 tons or part thereof.
2. Sampling Protocol: ASTM D3665 and ASTM D979. Collect at least one (1) random Sample per sub-lot from behind paver and before compaction. Any sample collected because of non-uniform appearance shall not be used in determining a pay factor for the Lot.
3. Testing Protocol: Field samples will be compacted in the laboratory and tested for:
  - a. Air voids, ASTM D3203.
  - b. Voids in the mineral aggregate, AI MS 2.

- c. Binder content, ASTM D6307.
- d. Aggregate gradation, ASTM D5444.

C. **Pay Reduction:** Lot is acceptable if binder content and aggregate gradation test deviations are within pay factor 1.00 limits in Table 1 or Table 2 as applicable. At ENGINEER's discretion a Lot with a sub-lot test deviation greater than pay factor 0.85 limits may stay in place at 50 percent pay.

| Table 1 – Pay Factors – Superpave Mix Design                 |            |   |             |             |              |
|--|------------|---|-------------|-------------|--------------|
| Criteria   | Pay Factor | Range of Mean of Deviations of Tests Results in Percentage Points from Binder and Gradation Targets |             |             |              |
|  |            | 500 Tons  | 1,000 Tons  | 1,500 Tons  | ≥ 2,000 Tons |
| Binder Content   | 1.00       | 0.0 – 0.7   | 0.0 – 0.54  | 0.0 – 0.46  | 0.0 – 0.41   |
|  | 0.975      | 0.71 – 0.8  | 0.55 – 0.61 | 0.47 – 0.52 | 0.42 – 0.46  |
|  | 0.95       | 0.81 – 0.9  | 0.62 – 0.68 | 0.53 – 0.58 | 0.47 – 0.52  |
|  | 0.90       | 0.9 – 1.0   | 0.69 – 0.75 | 0.59 – 0.64 | 0.53 – 0.56  |
|  | 0.85       | 1.01 – 1.1  | 0.76 – 0.82 | 0.65 – 0.69 | 0.57 – 0.61  |
| 1/2" and larger Sieve  | 1.00       | 0.0 – 10.0  | 0.0 – 7.3   | 0.0 – 6.3   | 0.0 – 5.6    |
|  | 0.975      | 11.0 – 12.0   | 7.4 – 8.3   | 6.4 – 7.1   | 5.7 – 6.3    |
|  | 0.95       | 13.0 – 13.9   | 8.4 – 9.3   | 7.2 – 7.9   | 6.4 – 7.0    |
|  | 0.90       | 14.0 – 14.9   | 9.4 – 10.3  | 8.0 – 8.7   | 7.1 – 7.7    |
|  | 0.85       | 15.0 – 16.0   | 10.4 – 11.3 | 8.8 – 9.5   | 7.8 – 8.4    |
| 3/8" Sieve   | 1.00       | 0.0 – 9.9   | 0.0 – 6.9   | 0.0 – 5.9   | 0.0 – 5.3    |
|  | 0.975      | 10.0 – 10.9   | 7.0 – 7.8   | 6.0 – 6.6   | 5.4 – 5.9    |
|  | 0.95       | 11.0 – 11.9   | 7.9 – 8.7   | 6.7 – 7.3   | 6.0 – 6.6    |
|  | 0.90       | 12.0 – 13.9   | 8.8 – 9.6   | 7.4 – 8.0   | 6.7 – 7.2    |
|  | 0.85       | 14.0 – 15.0   | 9.7 – 10.5  | 8.1 – 8.9   | 7.3 – 7.9    |
| No. 4 Sieve  | 1.00       | 0.0 – 9.9   | 0.0 – 6.7   | 0.0 – 5.7   | 0.0 – 5.2    |
|  | 0.975      | 10.0 – 10.9   | 6.8 – 7.6   | 5.8 – 6.3   | 5.3 – 5.8    |
|  | 0.95       | 11.0 – 11.9   | 7.7 – 8.5   | 6.4 – 6.9   | 5.9 – 6.4    |
|  | 0.90       | 12.0 – 12.9   | 8.6 – 9.4   | 7.0 – 7.5   | 6.5 – 7.0    |
|  | 0.85       | 13.0 – 14.0   | 9.5 – 10.2  | 7.6 – 8.0   | 7.1 – 7.6    |
| No. 8 Sieve  | 1.00       | 0.0 – 7.9   | 0.0 – 5.6   | 0.0 – 4.8   | 0.0 – 4.3    |
|  | 0.975      | 8.0 – 8.9   | 5.7 – 6.3   | 4.9 – 5.4   | 4.4 – 4.8    |
|  | 0.95       | 9.0 – 9.9   | 6.4 – 7.0   | 5.5 – 6.0   | 4.9 – 5.3    |
|  | 0.90       | 10.0 – 10.9   | 7.1 – 7.7   | 6.1 – 6.6   | 5.4 – 5.8    |
|  | 0.85       | 11.0 – 12.0   | 7.8 – 8.5   | 6.7 – 7.2   | 5.9 – 6.4    |
| No. 200 Sieve  | 1.00       | 0.0 – 3.0   | 0.0 – 2.4   | 0.0 – 2.0   | 0.0 – 1.8    |
|  | 0.975      | 3.1 – 3.5   | 2.5 – 2.7   | 2.1 – 2.2   | 1.9 – 2.0    |
|  | 0.95       | 3.6 – 4.0   | 2.8 – 3.0   | 2.3 – 2.4   | 2.1 – 2.2    |
|  | 0.90       | 4.1 – 4.5   | 3.1 – 3.3   | 2.5 – 2.7   | 2.3 – 2.4    |
|  | 0.85       | 4.6 – 5.0   | 3.4 – 3.6   | 2.8 – 3.0   | 2.5 – 2.6    |
| NOTES  |            |   |             |             |              |
| (a) Test binder content using a burn-off oven, ASTM D6307.   |            |   |             |             |              |
| (b) Determine aggregate gradation by extraction, ASTM D5444. |            |   |             |             |              |

| Table 2 – Pay Factors - Marshall Mix Design                  |            |   |            |            |            |             |
|--|------------|---|------------|------------|------------|-------------|
| Criteria   | Pay Factor | Range of Mean of Deviations of Tests Results from the Binder and Gradation Targets in Percentage Points |            |            |            |             |
|  |            | 500 Tons  | 1,000 Tons | 1,500 Tons | 2,000 Tons | ≥2,500 Tons |
| Binder Content   | 1.00       | 0.00–0.70   | 0.00–0.54  | 0.00–0.46  | 0.00–0.41  | 0.00–0.38   |
|  | 0.975      | 0.71–0.80   | 0.55–0.61  | 0.47–0.52  | 0.42–0.46  | 0.39–0.43   |
|  | 0.95       | 0.81–0.90   | 0.62–0.68  | 0.53–0.58  | 0.47–0.52  | 0.44–0.47   |
|  | 0.90       | 0.91–1.00   | 0.69–0.75  | 0.59–0.64  | 0.53–0.56  | 0.48–0.52   |
|  | 0.85       | 1.01–1.10   | 0.76–0.82  | 0.65–0.69  | 0.57–0.61  | 0.53–0.56   |
| 1/2"and larger Sieve   | 1.00       | 0.0–10.9  | 0.0–7.3    | 0.0–6.5    | 0.0–5.6    | 0.0–5.2     |
|  | 0.975      | 11.0–12.9   | 7.4–8.3    | 6.4–7.1    | 5.7–6.3    | 5.3–5.8     |
|  | 0.95       | 13.0–13.9   | 8.4–9.3    | 7.2–7.9    | 6.4–7.0    | 5.9–6.4     |
|  | 0.90       | 14.0–14.9   | 9.4–10.3   | 8.0–8.7    | 7.1–7.7    | 6.5–7.1     |
|  | 0.85       | 15.0–16.0   | 10.4–11.3  | 8.8–9.5    | 7.8–8.4    | 7.2–7.7     |
| 3/8" Sieve   | 1.00       | 0.0–9.9   | 0.0–6.9    | 0.0–5.9    | 0.0–5.3    | 0.0–4.9     |
|  | 0.975      | 10.0–10.9   | 7.0–7.8    | 6.0–6.6    | 5.4–6.9    | 5.0–5.5     |
|  | 0.95       | 11.0–11.9   | 7.9–8.7    | 6.7–7.3    | 6.0–6.6    | 5.6–6.1     |
|  | 0.90       | 12.0–13.9   | 8.8–9.6    | 7.4–8.0    | 6.7–7.2    | 6.2–6.6     |
|  | 0.85       | 14.0–15.0   | 9.7–10.5   | 8.1–8.9    | 7.3–7.9    | 6.7–7.2     |
| No. 4 Sieve  | 1.00       | 0.0–9.9   | 0.0–6.7    | 0.0–5.7    | 0.0–5.2    | 0.0–4.8     |
|  | 0.975      | 10.0–11.0   | 6.8–7.6    | 5.8–6.3    | 5.3–5.8    | 4.9–5.4     |
|  | 0.95       | 11.1–11.9   | 7.7–8.5    | 6.4–6.9    | 5.9–6.4    | 5.5–5.9     |
|  | 0.90       | 12.0–12.9   | 8.6–9.4    | 7.0–7.5    | 6.5–7.0    | 6.0–6.5     |
|  | 0.85       | 13.0–14.0   | 9.5–10.2   | 7.6–8.0    | 7.1–7.6    | 6.6–7.0     |
| No. 8 Sieve  | 1.00       | 0.0–7.9   | 0.0–5.6    | 0.0–4.8    | 0.0–4.3    | 0.0–4.0     |
|  | 0.975      | 8.0–8.9   | 5.7–6.3    | 4.9–5.4    | 4.4–4.8    | 4.1–4.5     |
|  | 0.95       | 9.0–9.9   | 6.4–7.0    | 5.5–6.0    | 4.9–5.3    | 4.6–4.9     |
|  | 0.90       | 10.0–10.9   | 7.1–7.7    | 6.1–6.6    | 5.4–5.8    | 5.0–5.4     |
|  | 0.85       | 11.0–12.0   | 7.8–8.5    | 6.7–7.2    | 5.9–6.4    | 5.5–5.8     |
| No. 16 Sieve   | 1.00       | 0.0–7.9   | 0.0–5.2    | 0.0–4.6    | 0.0–4.2    | 0.0–3.9     |
|  | 0.975      | 8.0–8.9   | 5.3–5.8    | 4.7–5.1    | 4.3–4.6    | 4.0–4.3     |
|  | 0.95       | 9.0–9.9   | 5.9–6.4    | 5.2–5.6    | 4.7–5.1    | 4.4–4.7     |
|  | 0.90       | 10.0–10.9   | 6.5–7.0    | 5.7–6.1    | 5.2–5.5    | 4.8–5.1     |
|  | 0.85       | 11.0–12.0   | 7.1–7.6    | 6.2–6.6    | 5.6–5.9    | 5.2–5.4     |
| No. 50 Sieve   | 1.00       | 0.0–6.9   | 0.0–4.3    | 0.0–3.8    | 0.0–3.4    | 0.0–3.2     |
|  | 0.975      | 7.0–7.9   | 4.4–4.8    | 3.9–4.1    | 3.5–3.8    | 3.3–3.5     |
|  | 0.95       | 8.0–8.9   | 4.9–5.3    | 4.2–4.5    | 3.9–4.1    | 3.6–3.8     |
|  | 0.90       | 9.0–9.9   | 5.4–5.8    | 4.6–4.9    | 4.2–4.4    | 3.9–4.1     |
|  | 0.85       | 10.0–11.0   | 5.9–6.4    | 5.0–5.5    | 4.5–4.9    | 4.2–4.5     |
| No. 200 Sieve  | 1.00       | 0.0–3.0   | 0.0–2.4    | 0.0–2.0    | 0.0–1.8    | 0.0–1.7     |
|  | 0.975      | 3.1–3.5   | 2.5–2.7    | 2.1–2.2    | 1.9–2.0    | 1.8–1.9     |
|  | 0.95       | 3.6–4.0   | 2.8–3.0    | 2.3–2.4    | 2.1–2.2    | 2.0–2.1     |
|  | 0.90       | 4.1–4.5   | 3.1–3.3    | 2.5–2.7    | 2.3–2.4    | 2.2–2.3     |
|  | 0.85       | 4.6–5.0   | 3.4–3.6    | 2.8–3.0    | 2.5–2.6    | 2.4–2.5     |
| NOTES  |            |   |            |            |            |             |
| (a) Test binder content using a burn-off oven, ASTM D6307.   |            |   |            |            |            |             |
| (b) Determine aggregate gradation by extraction, ASTM D5444. |            |   |            |            |            |             |

D. **Installation:** See Section 32 12 16.13 acceptance requirements.



## PART 2 PRODUCTS

### 2.1 BINDER

- A. **Performance Graded Asphalt Binder (PGAB):** See ASTM D6373.
1. Blending with polymers is allowed.
  2. Do not use acid blends without documentation supporting need.
  3. Adjust binder grade according to AASHTO M323 to account for any binder stiffness caused by adding RAP or ROSP to the mix.
- B. **Bitumen Binder:** Oil Sand (OS) source is CONTRACTOR's choice.
- C. **Blended Binder:** CONTRACTOR's choice. A blended ratio of Asphalt Binder to Bitumen Binder in the range of about 1:4 to about 4:1 may require patent licensure (Reference: US RE39, 289 E). CONTRACTOR to verify.

### 2.2 AGGREGATE

- A. Crushed stone, crushed gravel, slag, sand, or combination.
- B. Use Table 3 to determine suitability of aggregate source.

| Table 3 – Aggregate Physical Properties  |                     |          |            |     |
|--|---------------------|----------|------------|-----|
|  |                     | Standard | Road Class |     |
|  |                     |          | I & II     | III |
| Coarse Aggregate   |                     |          |            |     |
| Angularity, percent, minimum   | One Fractured face  | D5821    | 90         | 95  |
|  | Two Fractured faces |          | 90         | 90  |
| Wear (hardness or toughness), percent, maximum   |                     | C131     | 35         | 35  |
| Flats or elongates (3:1 length to width), percent, maximum                                       |                     | D4791    | --         | 20  |
| Fine Aggregate   |                     |          |            |     |
| Angularity (uncompacted void content), percent, minimum  |                     | T304     | 40         | 45  |
| Sand equivalent, percent, minimum  |                     | D2419    | 45         | 60  |
| Plastic limit, maximum   |                     | D4318    | 0          | 0   |
| Blended Physical Properties  |                     |          |            |     |
| Dry-rodded Unit Weight, lb/ft <sup>3</sup> , minimum   |                     | C29      | 75         | 75  |
| Weight Loss (Soundness), percent, maximum  |                     | C88      | 16         | 16  |
| Friable particles, percent, maximum  |                     | C142     | 2          | 2   |
| NOTES  |                     |          |            |     |
| (a) Road Class is defined in Section 32 01 31.   |                     |          |            |     |
| (b) Course aggregate does not pass No. 4 sieve. Fine aggregate does pass.                        |                     |          |            |     |
| (c) Angularity is determined by weight.  |                     |          |            |     |
| (d) Wear of aggregate may have higher values if aggregate source is known to have higher values. |                     |          |            |     |
| (e) Sand equivalent is waived for RAP or ROSP aggregate but applies to the                       |                     |          |            |     |

|   |
|---|
| <p>remainder of the aggregate blend.</p> <p>(f) Plastic limit, passing No. 40 sieve. Aggregate is non-plastic even when filler material is added to the aggregate.</p> <p>(g) Weight loss, using sodium sulfate.</p> <p>(g) Friable particles are clay lumps, shale, wood, mica, coal passing the No. 4 sieve, and other deleterious materials.</p> |
|---|

### 2.3 ADDITIVES

- A. Mineral Filler: ASTM D242.
- B. Recycle Agent: ASTM D4552.
- C. Anti-strip Agent: Heat stable cement slurry, lime slurry, or chemical liquid.
- D. RAP or ROSP: Free of detrimental quantities of deleterious materials.
  1. Allowed up to 15 percent by weight of RAP or binder, whichever is lesser, with no change in specified binder grade.
  2. Allowed from 15 to 30 percent by weight of RAP or binder, whichever is lesser, if the binder grade is adjusted according to AASHTO M323 to meet the specified binder grade.
  3. Determine RAP binder content by chemical extraction.

### 2.4 MIX DESIGN

- A. **Preparation:**
  1. Get the Mix Designator and the Road Class from the OWNER, ENGINEER, or bid documents.
  2. Use paragraph 1.4C to determine submittal requirements.
- B. **Aggregate Gradation – Superpave Mix Design:** See Table 4. The Target Gradation Curve for the specified aggregate grade must lie within the Master Grading Band limits. The target grading band limits for the Target Grading Curve are the appropriate grading limits for pay factor 1.00 in Table 1. The target grading band limits are allowed to extend outside of the Master Grading Band limits.

| Table 4 - Master Grading Bnds - Superpave Mix Design   |              |              |              |              |
|--|--------------|--------------|--------------|--------------|
| Sieve  | Grade        |              |              |              |
|  | SP-1         | SP-3/4       | SP-1/2       | SP-3/8       |
| 1.5 inch   | 100.0        | —            | —            | --           |
| 1 inch   | 90.0 – 100.0 | 100.0        | —            | --           |
| 3/4 inch   | < 90         | 90.0 – 100.0 | 100.0        | —            |
| 1/2 inch   | —            | < 90         | 90.0 – 100.0 | 100.0        |
| 3/8 inch   | —            | —            | < 90         | 90.0 – 100.0 |
| No. 4  | —            | —            | —            | < 90         |
| No. 8  | 19.0 – 45.0  | 23.0 – 49.0  | 28.0 – 58.0  | 32.0 – 67.0  |
| No. 200  | 1.0 – 7.0    | 2.0 – 8.0    | 2.0 – 10.0   | 2.0 – 10.0   |
| NOTES  |              |              |              |              |
| (a) Gradation is expressed in percent passing by weight per ASTM C136. Percentage of fines passing No. 200 sieve determined by washing per |              |              |              |              |

- ASTM C117.

(b) The alpha portion of the grade designator (SP) represents Superpave mix. The numerical portion ( 1, 3/4, 1/2, 3/8) represents the *nominal maximum* sieve size.

C. **Aggregate Gradation – Marshall Mix Design:** See Table 5. The Target Gradation Curve for the specified aggregate grade must lie within the Master Grading Band limits. The target grading band limits for the Target Grading Curve are the appropriate grading limits for pay factor 1.00 in Table 2. The target grading band limits are allowed to extend outside of the Master Grading Band limits.

| Table 5 - Master Grading Band Limits - Marshal Mix Deisgn  |                  |         |         |          |          |          |
|--|------------------|---------|---------|----------|----------|----------|
| Sieve  | Aggregate Grades |         |         |          |          |          |
|  | DM-1             | DM-3/4  | DM-/2   | OM-1/2   | FM-1     | FM-1/2   |
| 1 inch   | 100              |         |         |          |          |          |
| 3/4 inch   |                  | 100     |         |          | 100      |          |
| 1/2 inch   | 75 - 91          |         | 100     | 100      | 90 - 100 | 100      |
| 3/8 inch   |                  | 75 - 91 |         | 93 - 100 | 60 - 100 | 90 - 100 |
| No. 4  | 47 - 61          | 46 - 62 | 60 - 80 | 36 - 44  | 15 - 40  | 30 - 50  |
| No. 8  |                  |         |         | 14 - 21  | 4 - 12   | 5 - 15   |
| No. 16   | 23 - 33          | 22 - 34 | 28 - 42 |          |          |          |
| No. 50   | 12 - 22          | 11 - 23 | 11 - 23 |          |          |          |
| No. 200  | 3 - 7            | 3 - 7   | 3 - 7   | 2 - 4    | 2 -5     | 2 - 5    |
| NOTES  |                  |         |         |          |          |          |
| (a) Gradation is expressed in percent passing by weight, ASTM C136. Percentage of fines passing No. 200 sieve determined by washing, ASTM C117.  |                  |         |         |          |          |          |
| (b) Friction Mixture, ASTM D3515.  |                  |         |         |          |          |          |
| (c) The alpha portion of the grade designator (DM, OM, FM) represents dense mix, open mix and friction mix. The numerical portion ( 1, 3/4, 1/2) represents the <i>maximum</i> sieve size. |                  |         |         |          |          |          |

## D. Design Parameters: Determined by AI MS-2.

| Table 6 - Mix Design Parameters  |                                  |      |                 |          |         |
|--|----------------------------------|------|-----------------|----------|---------|
|  | SuperPave                        |      |                 | Marshall |         |
| Compaction Level (b)   | 50Nd                             | 75Nd | 100Nd           | 50 blow  | 75 blow |
| Stability, lbs, minimum (c)  | --                               |      |                 | 1200     | 1800    |
| Flow, in 0.01 inch units (c)   | --                               |      |                 | 10 - 18  |         |
| Design Air Void Target, percent (d)  | 3.5                              |      |                 | 3.5      |         |
| Voids in Mineral Aggregate (VMA) relative to maximum or nominal sieve size grading and calculated using Gsb(dry), percent, minimm  | ASTM D3203                       |      | ASTM D6927      |          |         |
|  | Nominal Grading                  |      | Maximum Grading |          |         |
|  | 1                                | 12.0 | 1               | 13.0     |         |
|  | 3/4                              | 13.0 | 3/4             | 14.0     |         |
|  | 1/2                              | 14.0 | 1/2             | 15.0     |         |
|  | 3/8                              | 15.0 | 3/8             | 16.0     |         |
| RAP or ROSP specific gravity for calculations  | Gsb (dry) by chemical extraction |      |                 |          |         |
| Dust to Binder Ratio, maximum  | 1.4                              |      |                 | 1.6      |         |
| Tensile Strength Ratio (moisture sensitivity), minimum (e)   | -                                |      |                 | 0.80     |         |
| Rutting (Hamburg rut test) (f)   | AASHTO T324                      |      |                 |          |         |
| Road Class I   | --                               |      |                 | --       | --      |
| Road Class II  | 15 mm/10,000 passes              |      |                 | --       | --      |
| Road Class III   | 10 mm/20,000 passes              |      |                 | --       | --      |
| NOTES  |                                  |      |                 |          |         |
| (a) Road Class is defined in Section 32 01 31.   |                                  |      |                 |          |         |
| (b) 100Nd mix is for very high traffic applications only as defined by ENGINEER. 100Nd mix is intended for lower lift applications or surface applications with proactive seal coat program.   |                                  |      |                 |          |         |
| (c) Design Density Target: See ASTM D2041. Percent of maximum theoretical specific gravity.  |                                  |      |                 |          |         |
| (d) Stability, Flow, Voids: See ASTM D6927.  |                                  |      |                 |          |         |
| (e) Tensile Strength Ratio (moisture sensitivity): See ASTM D4867. Use freeze thaw conditioning. Compact test specimen to seven (7) percent plus or minus one (1) percent air voids.   |                                  |      |                 |          |         |
| (f) With testing performed at temperatures representing the <u>specified</u> binder grade in the Hamburg rut test, the average rut depth of two (2) mix design test Samples is less than the amount shown for the respective Road Classes. |                                  |      |                 |          |         |

## 2.5 SOURCE QUALITY CONTROL

- A. Collect Samples randomly, ASTM D3665. Do not change sampling points:
  - 1. Sampling aggregate, ASTM D75. Collect samples before the drum mixer.
  - 2. Sampling binder, ASTM D140.
  - 3. Sampling bituminous paving mixture, ASTM D979.
- B. Validate binder grade received from Supplier, Section 32 12 03.
- C. Test mix every production day for the following:
  - 1. Combined aggregate gradation in the mix, ASTM D5444.
  - 2. Binder content in the mix, ASTM D6307.
  - 3. Temperature of mix placed in the transport vehicle at the production plant.
    - a. Asphalt Binder mixes.
      - 1) Hot Mix: 325 deg F maximum.
      - 2) Warm Mix: 325 deg F maximum.
    - b. Bitumen Binder mixes or Blended Binder mixes.
      - 1) Hot Mix: NOT ALLOWED.
      - 2) Warm Mix: 230 degrees maximum.
- D. Warm Mix Testing: When rutting or moisture susceptibility tests are required on plant produced warm mix, condition the warm mix material before testing for two (2) hours at 275 plus or minus five (5) deg F per AASHTO R30 (short term aging). The material may be cooled to room temperature before conditioning.

## **PART 3 EXECUTION**

### 3.1 CONSTRUCTION EQUIPMENT

- A. Mixing Plant: ASTM D995. Provide.
  - 1. Positive means to determine the moisture content of aggregate.
  - 2. Positive means to sample all material components.
  - 3. Sensors to measure the temperature of the mix at discharge.
  - 4. Ability to maintain discharge temperature of mix.
  - 5. Capability of maintaining plus or minus five (5) percent tolerance on component percentages in final mix.
  - 6. Oil Sand Introduction System: **Do not burn off the light oils in Bitumen Binder (oil sand).**

**3.2 INSTALLATION**

- A. Pavement placement, Section 32 12 16.13.
- B. Pavement restoration, Section 33 05 25

END OF SECTION

**SECTION 32 12 16.13**  
**PLANT-MIX BITUMINOUS PAVING**

**PART 1    GENERAL**

**1.1 SECTION INCLUDES**

- A. Place a bituminous concrete pavement base course, leveling course, surface course, overlay course, or an inlay course.

**1.2 REFERENCES**

**A. AASHTO Standards:**

- R9      Acceptance Sampling Plans for Highway Construction.
- TP68   Bulk Specific Gravity and Density of Compacted Asphalt Mixtures Using Automatic Vacuum Sealing Method.
- T324   Hamburg Wheel-Track Testing of Compacted Hot-Mix Asphalt (HMA).

**B. ASTM Standards:**

- D979   Sampling Bituminous Paving Mixtures.
- D1188 Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples.
- D2041 Theoretical Maximum Specific Gravity of Bituminous Paving Mixtures.
- D2725 Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures.
- D2950 Density of Bituminous Concrete In Place by Nuclear Method.
- D3549 Thickness or Height of Compacted Bituminous Paving Mixture Specimens.
- D3665 Random Sampling of Construction Materials.
- D5361 Sampling Compacted Bituminous Mixtures for Laboratory Testing.
- D6927 Marshall Stability and flow of Bituminous Mixtures.

**1.3 DEFINITIONS**

- A. Must Grind: Defined in Section 32 01 31.
- B. Road Class: Defined in Section 32 01 31

**1.4 SUBMITTALS**

- A. **Before Delivery:** Submit 48 hours before delivery:
  - 1. Location and name of bituminous concrete production facility.
  - 2. Mix design method.
  - 3. Mix identification number or code.

4. Type, grade, and weight of binder.
  5. Type, grade, and weight of aggregate.
  6. Traffic control plan, Section 01 55 26.
  7. Type and number of rollers.
  8. Manufacturer's certificate of compliance for paving geotextiles.  
(Refer to Section 31 05 19).
  9. Certification of profilograph and profilograph operator.
  10. Cold weather paving plan.
- B. **At Delivery:** For each batch delivered to site identify:
1. Date and project description.
  2. Producer and plant.
  3. Name of contractor.
  4. Serial number of ticket.
  5. Mix identification number or code.
  6. Truck number and time dispatched.
  7. Volume of mix delivered.
- C. **After Placement:** Before final payment submit summary report describing profile deviation and profile roughness. See Section 32 01 31.

### 1.5 .QUALITY ASSURANCE

- A. Do not change aggregate source or binder grade until ENGINEER accepts new source and new mix design.
- B. Reject product and work that does not meet requirements of this Section.
- C. Remove product found defective after installation and install acceptable product at no additional cost to OWNER.
- D. Foreman of paving crew has completed at least three (3) projects of similar size and nature.
- E. If requested, submit a quality control and testing report describing source and field quality assurance activities performed by CONTRACTOR and Suppliers.
- F. For all equipment and hand tools used to mix, haul, and place the bituminous concrete, use a release agent that does not dissolve asphalt and is acceptable to ENGINEER.

### 1.6 WEATHER

- A. Temperature:
  1. April 15 to October 15: Place pavement when air temperature in the shade and the roadway surface temperature are above 50 deg F. The ENGINEER determines may provide written approval if it is acceptable to place outside of this temperature limit.
  2. Before April 15 and After October 15: Provide a Cold Weather Paving Plan. ENGINEER must accept the plan before proceeding.



Include the following details.

- a. Haul details.
  - b. Placement details.
  - c. Compaction aids used in production.
  - d. Coordination procedure for acceptance testing.
- B. Moisture: Do not place on frozen base, during adverse climatic conditions such as precipitation, or when roadway surface is wet or icy.

#### 1.7 NOTICE

- A. Follow Laws and Regulations concerning when and to whom notices are to be given. Send written notice at least three (3) days before start of paving.
- B. Indicate paving time and when new surface can be used.
- C. Warn of potential vehicle tow away and other construction issues affecting neighborhood.
- D. Should work not occur on specified day, send a new notice.

#### 1.8 ACCEPTANCE

##### A. **General:**

1. Acceptance is by Lot.
2. If non-complying material has been installed and no price for the material is specified, apply pay adjustment against cost of work requiring complying material as part of its installation, Section 01 29 00.
3. Dispute resolution, Section 01 35 10.
4. Opening a paved surface to traffic does not constitute acceptance.
5. Observation of CONTRACTOR's field quality control testing does not constitute acceptance. Such testing; however, may be used by ENGINEER for acceptance if requirements of Section 01 35 10 are met.

- B. **Mix Material:** Accepted as specified for bituminous concrete , Section 32 12 05, or rubberized asphalt concrete, Section 32 12 08.

##### C. **Mix Temperature at Site:**

1. Reject mixes in the transport material exceeding the following temperatures.
  - a. Hot mix, 425 deg F.
  - b. Warm mix, 300 deg F.
  - c. Oil sand bituminous concrete, 230 deg F.
2. Dispose of cold mix in paver hopper as thin spread underlay.

- D. **Grade, Cross Slope:** Verify tolerances are not exceeded.

- E. **Compaction:** Options for acceptance are 1) core density, 2) non-destructive test density, or 3) control strip density with visual observation. Use core density unless specified elsewhere. A Lot is acceptable if density tests are within pay factor 1.00 limits. At ENGINEER's discretion, a Lot with deficient sub-lot density tests may be accepted if pay is adjusted using an applicable pay factor in the following table, or accepted at 50 percent pay if a sub-lot is in Reject.

| <b>Table 1 – Compaction Pay Factors</b> |   |                      |
|---|---|----------------------|
| <b>Pay Factor</b>                       | <b>Density, in Percent<br/>Relative to ASTM D2041</b> |                      |
|   | <b>Average</b>  | <b>Lowest Test</b>   |
| 0.70                                    | More than 96  | –                    |
| <b>1.00</b>                             | <b>92 to 96</b>                                       | <b>89 or greater</b> |
| 0.90                                    | 92 to 96  | Less than 89         |
| 0.80                                    | Less than 92  | 89 or greater        |
| Reject                                  | Less than 92  | Less than 89         |

1. **Core Density:** This method compares the average density of cores extracted from a pavement surface to maximum theoretical density:
  - a. Lot Size: One (1) day production with 1,000 square yard sub-lots or part thereof.
  - b. Sampling Protocol: Use ASTM D3665 to randomly select in each sub-lot at least one (1) surface test location and one (1) longitudinal joint test location. Collect at least two (2) test samples at each test location, ASTM D5361. Samples are full depth or overlay depth in overlay construction.
  - c. Testing Protocol: ASTM D2725 for core density and ASTM D2041 (Rice) for maximum theoretical density.
2. **Non-Destructive Density Testing by Gage:**
  - a. Lot Size: One (1) day production with 1,000 square yard sub-lots or part thereof.
  - b. Sampling Protocol: Use ASTM D3665 to randomly select in each sub-lot at least one (1) surface test location and one (1) longitudinal joint test location.
  - c. Testing Protocol: ASTM D2950 (nuclear gage) or AASHTO TP68 (non-nuclear gage) and ASTM D2041 (Rice) for maximum theoretical density.
3. **Control Strip Density with Visual Observation:**
  - a. Lot: One (1) day production.
  - b. Sampling Protocol: Not required after rolling pattern is determined.
  - c. Testing Protocol: ASTM D6927 (Marshall) and D2041 (Rice method) to determine rolling pattern for 94 percent compaction, thereafter visual examination.
4. **Compaction Dispute Resolution:**

- a. CONTRACTOR:
    - 1) Provide an Independent Testing Agency, Section 01 45 00.
    - 2) Take two (2) supplement cores midway between deficient acceptance test locations, and midway between a deficient test location and an adjacent acceptable test location.
    - 3) Patch core holes.
    - 4) Conduct testing at no additional cost to OWNER.
  - b. ENGINEER:
    - 1) Accept Lot at full pay if new information shows compliance, or
    - 2) Accept Lot at pay reduction using new test information, or
    - 3) Reject Lot.
- F. **Thickness:** A Lot is acceptable if test deficiencies are within pay factor 1.00 limits. At ENGINEER’s discretion, a Lot with sub-lot deficiencies greater than allowed for pay factor 1 in the following table may be accepted if pay is adjusted using one of the following applicable pay factors, or accepted at 50 percent pay if a sub-lot is in Reject.

| Table 2 – Thickness Pay Factor |                              |
|--------------------------------|------------------------------|
| Pay Factors                    | Deficiency Limits, in Inches |
| 1.00                           | 0.00 to 0.375                |
| 0.90                           | 0.376 to 0.50                |
| 0.70                           | 0.51 to 0.75                 |
| Reject                         | 0.76 to 1.00                 |

- 1. **Lot Size:** One (1) day production with 1,000 square yard sub-lots or part thereof.
- 2. **Sampling Protocol:** Use ASTM D3665 to randomly select at least one surface test location and one longitudinal joint test location in each sub-lot. Collect at least two (2) core samples at each test location, ASTM D5361. Samples are full depth. Overlay construction measured only on overlay portion of core sample.
- 3. **Testing Protocol:** ASTM D3549:
  - a. **Minimum Specified Thickness:** A Lot specified to have minimum thickness will be accepted if all sub-lot measurements meet or exceed minimum. If thickness is deficient, additional material may be placed over the deficient thickness if there is no pavement feathering; placement matches this section’s thickness tolerance; surface continues to drain; and roughness tolerance is met.
  - b. **Actual Specified Thickness:** A Lot specified to have actual thickness is acceptable if any sub-lot measurement does not exceed deficiency limits for thickness pay factor 1.00.

**4. Thickness Dispute Resolution:****a. CONTRACTOR:**

- 1) Hire an Independent Testing Agency, Section 01 45 00.
- 2) Take two (2) additional cores midway between deficient acceptance test locations, and midway between a deficient test location and the next adjacent acceptable test location.
- 3) Patch core holes.
- 4) Conduct testing at no additional cost to OWNER.

**b. ENGINEER:**

- 1) Graph deficient areas by plotting new cores and original cores to define deficient areas assuming the following.
  - a) The graph represents the thickness of the pavement.
  - b) Thicknesses vary linearly along the pavement length from core depth to core depth.
  - c) The pavement is a constant depth in the transverse direction.
- 2) Accept Lot at full pay if new information shows compliance, or
- 3) Accept Lot at pay reduction using new test information, or
- 4) Reject Lot.

**G. Profile Roughness and Profile Deviation:** Section 32 01 31.

**1.9 WARRANTY**

- A.** Joints at Street Fixtures and Portland Cement Concrete Flat Work: If wider than 1/2 inch before end of the correction period seal joints with asphalt rubber or rubberized asphalt; Section 32 01 17.

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**PART 2 PRODUCTS**


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**2.1 MATERIALS**

- A.** Bituminous concrete, Section 32 12 05.
- B.** Rubberized asphalt concrete, Section 32 12 08.
- C.** Tack coat, Section 32 12 13.13.
- D.** Prime coat, Section 32 12 13.19.
- E.** Paving geotextile, Section 31 05 19.
- F.** Paving geogrid, Section 31 05 21.

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**PART 3 EXECUTION**


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### 3.1 CONSTRUCTION EQUIPMENT

- A. Paver Machine: Use track equipment when operating on fabrics, geogrids or pavement mats hotter than 180 deg F
- B. Compactors: Steel wheel static or vibratory. Use pneumatic tire roller for intermediate rolling only.

### 3.2 PREPARATION

- A. General:
  - 1. Locate and preserve utilities Section 01 31 13. Contact utility companies and other agencies, for dangerous concentration of combustible, flammable, or explosive matter.
  - 2. Lower Street Fixtures if paving machine is not capable of passing over the fixtures.
  - 3. Remove vegetation from cracks, edges and joints. Sweep surface clean. Blow cracks clean. Remove leaves.
  - 4. Fill cracks and fix Potholes, Section 32 01 17.
  - 5. Stabilize Portland cement concrete subgrade slabs.
- B. Traffic Control:
  - 1. Implement notification and traffic control plan requirements, Section 01 55 26. Do not proceed without certified flaggers.
  - 2. Apply temporary lane marking tape or paint after layout has been verified with ENGINEER.
- C. Aggregate Base Course:
  - 1. Verify base course is placed to grade, compacted and dampened.
  - 2. If indicated, follow Section 31 31 19 requirements for herbicide treatment or Section 32 12 13.19 for prime coat applications.

### 3.3 PROTECTION

- A. Trees, Plants, Ground Cover:
  - 1. Protect trees, plants and other ground cover from damage.
  - 2. Prune trees to allow equipment passage underneath, Section 32 01 93. Repair tree damage at no additional cost to OWNER.
- B. Protect all structures, including curb, gutter, sidewalks, guard rails and guide posts from physical damage. Remove spatter, over-coat, or mar.
- C. Do not discharge bituminous materials into borrow pits or gutters.
- D. Protect hot pavement from traffic until cool enough not to become marred.
- E. Remove saw-cut dust immediately. Protect neighborhood, storm drains and down-stream fish habitat.

**3.4 TEMPORARY SURFACING**

- A. Place, roll, maintain, remove and dispose of temporary Pavement surfaces.
- B. In sidewalk areas construct temporary pavements at least 1 inch thick and in all other areas at least two (2) inches thick. At major intersections and other critical locations a greater thickness may be required.

**3.5 LINE AND GRADE CONTROL**

- A. Provide necessary survey stakes for horizontal and vertical control.
- B. Furnish, place, and maintain supports, wire devices, and materials as required to provide continuous line and grade reference controls for placing pavement, matching existing pavement surfaces, etc.

**3.6 FABRIC PLACEMENT**

- A. Section 31 05 19.

**3.7 PAVEMENT PLACEMENT**

- A. General:

1. Barricade off or eliminate fall off edges.
2. Provide continuous forward paver movement so temperature 10 feet behind paver is as follows:
  - a. Warm Mix Placement: 200 deg F minimum.
  - b. Hot Mix Placement:

| <b>Table 3 – Minimum Pavement Temperature in Degrees F.</b> |                                |           |               |           |           |            |
|---|--------------------------------|-----------|---------------|-----------|-----------|------------|
| <b>Air Temperature<br/>Deg F</b>                            | <b>Compacted Mat Thickness</b> |           |               |           |           |            |
|   | <b>3/4"</b>                    | <b>1"</b> | <b>1-1/2"</b> | <b>2"</b> | <b>3"</b> | <b>4"+</b> |
| 45 – 50   | –                              | –         | –             | –         | 280       | 265        |
| 50 - 59   | –                              | –         | –             | 280       | 270       | 255        |
| 60 - 69   | –                              | –         | 285           | 275       | 265       | 250        |
| 70 - 79   | 285                            | 285       | 280           | 270       | 265       | 250        |
| 80 - 89   | 280                            | 275       | 270           | 265       | 260       | 250        |
| 90 +  | 275                            | 270       | 265           | 260       | 250       | 250        |

- B. Overlays or Subsequent Lifts:

1. Allow new base pavement or new inlay pavement to cure (harden) before placing overlays.
2. Apply tack coat per Section 32 12 13.13 if inlay or sub-base Pavement surface is dirty or older than 24 hours.

- C. Irregular Areas: Handwork is acceptable if specified grade, slope, compaction and smoothness are achieved.

- D. Compaction:

1. Test mix placement until a compaction pattern is acceptable to CONTRACTOR. Continue random quality control testing.
2. Do not over compact or under compact.

3. Complete compaction before the following temperature are reached:
  - a. 180 deg F for hot mixes.
  - b. 140 deg F for warm mixes.
- E. Joints:
  1. Construct joints to industry standards for texture, density and smoothness.
  2. Clean contact surfaces and apply tack coat. Ensure continuous bond between old and new pavements, or between successive day's work.
  3. Offset longitudinal joints a minimum of 12 inches in succeeding courses and at least six (6) feet transversely to avoid a vertical joint through more than one course. In the top course restrict longitudinal joint to 1 foot either side of lane lines.
  4. Prevent traffic, including construction traffic, from crossing vertical edges. Apply tack coat to vertical edges before making another pass with paver if mix has cooled to 90 deg F

### 3.8 TOLERANCES

- A. Compaction: Target is 94 percent of ASTM D2041 (Rice density) plus or minus two (2) percent.
- B. Lift Thickness: If not indicated, meet the following tolerances.

| Table 4 – Lift Thickness Tolerance          |                                       |   |
|---|---------------------------------------|---|
| Mix Design Method                           | Minimum                               | Maximum   |
| Marshall                                    | 2 times maximum aggregate size        | Not more than limits established by manufacturer of compactor equipment |
| Performance Grade (Superpave)               | 4 times <i>nominal</i> aggregate size |   |
| NOTES                                       |                                       |   |
| (a) Thickness is measured after compaction. |                                       |   |

- C. Smoothness:
  1. Parallel to Centerline: Section 32 01 31.
  2. Cross Slope: 1/4 inch in 10 feet except at cross section grade breaks.

### 3.9 REPAIR

- A. Repair ride disturbing or unsafe butt joints. Repair expense is at no additional cost to OWNER.
- B. If pavement smoothness is deficient, follow Section 32 01 31 repair requirements.
- C. Corrective Action for Profile Deviations (“Must Grinds”): Grinding is acceptable. See Section 32 01 26. Apply a fog seal over grind areas. See Section 32 01 13.50. If depressions cannot be corrected by grinding, remove and replace.
- D. Corrective Action for Profile Roughness Index: Grinding is acceptable. Re-profile corrected segments to verify ride index meets tolerance. Apply a fog seal over grind areas. See Section 32 01 13.50.

- E. When thickness is deficient, place additional material over deficient areas. DO NOT skin patch. Mill for inlay if necessary.
- F. Defective Joints, Seams, Edges: Repair.
- G. Unacceptable Paving: Remove and replace.

### 3.10 **OPENING TO TRAFFIC**

- A. Temperature of pavement surface is not more than 180 deg F

END OF SECTION



# **DIVISION 03**

## **CONCRETE**

## SECTION 03 11 00 CONCRETE FORMING

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### PART 1 GENERAL

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#### 1.1 SECTION INCLUDES

- A. Formwork for cast-in-place concrete.
- B. Openings in formwork for other affected work.
- C. Form accessories such as snap ties, bracing, etc.
- D. Stripping formwork.

#### 1.2 REFERENCES

- A. **ACI Standards.**

347 Recommended Practice for Concrete Formwork.

#### 1.3 DEFINITIONS

- A. **Shoring:** The activity to support formwork.
- B. **Reshoring:** The activity to reduce the amount of formwork supporting concrete elements. As concrete sets and strength increases, less need for formwork occurs gradually until concrete becomes free standing.

#### 1.4 SUBMITTALS

- A. Shop Drawings: Fabrication and erection drawings of forms for specific finished concrete surfaces, as indicated. Show general construction of forms, jointing, special joints or reveals, location and pattern of form tie placement, and other items affecting exposed concrete visibility.
- B. Form Release Agent: Where concrete surfaces are scheduled to receive special finishes or applied coverings which may be affected by agent submit manufacturer's instructions for use of agent.

#### 1.5 QUALITY ASSURANCE

- A. Designer's Qualifications: Structural design professional who complies with Utah licensing law, has experience in concrete formwork, and is acceptable to the authority having jurisdiction.
- B. Design Forms:
  - 1. With sufficient strength to maintain finished tolerances indicated in Section 03 35 00, to support loads, pressures, and allowable stresses as outlined in ACI 347 and for design considerations such as wind loads, allowable stresses, and other applicable requirements of local Laws and Regulations.
  - 2. To permit easy removal.
  - 3. For required finishes.

- C. Design, engineering, and construction of formwork is CONTRACTOR's responsibility.

#### **1.6 JOB CONDITIONS**

- A. For reference purposes, establish and maintain sufficient control points and bench marks to check tolerances. Maintain in an undisturbed condition and until final completion and acceptance of Work.
- B. Regardless of tolerances specified, allow no portion of Work to extend beyond legal boundaries.

#### **1.7 FIELD SAMPLES**

- A. Prepare field Samples and submit per Section 01 33 00.
- B. Construct and erect sample formwork panel for architectural concrete surfaces receiving special treatment or finish as a result of formwork. Formwork to include vertical and horizontal form joints and typical rustication joints when required.
- C. Size panel to indicate special treatment or finish required, including form release agent.
- D. Remove formwork after casting concrete.

#### **1.8 ACCEPTANCE**

- A. Secure ENGINEER's inspection of form layout for concrete flat work.

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### **PART 2 PRODUCTS**

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#### **2.1 FORM MATERIALS**

- A. Faced with material which will produce smooth and uniform texture on concrete, unless indicated otherwise.
- B. Arrange facing material orderly and symmetrical, keeping number of seams to a minimum.
- C. Do not use material with raised grain, patches, or other defects which will impair texture of concrete surface.

#### **2.2 FORMWORK ACCESSORIES**

- A. Form Ties:
  - 1. Use ties constructed so end fasteners can be removed without spalling concrete faces.
  - 2. After end fasteners of ties have been removed, embedded portion of ties are to terminate not less than two (2) times the diameter or thickness of the fasteners from formed faces of concrete, but in no case greater than 3/4 inch.
  - 3. When formed face on concrete is not exposed, form ties may be cut off flush with formed surfaces. Use ties with 3/4 inch diameter cones on both ends or an approved equal for water retaining structures.
- B. Premolded Expansion Joint Filler: F1 sheet, Section 32 13 73 unless

indicated elsewhere.

- C. Form Release Agent: Colorless material which will not stain concrete, absorb moisture, impair natural bonding or color characteristics of concrete. To prevent contamination, agents used on potable water structures are subject to review by ENGINEER before use.
- D. Fillets for Chamfered Corners: Wood strips 1 inch x 1 inch size, maximum length possible.

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## **PART 3 EXECUTION**

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### **3.1 INSPECTION**

- A. Verify lines, levels, and measurements before proceeding with formwork.

### **3.2 FORM CONSTRUCTION**

- A. Make forms sufficiently tight to prevent loss of concrete.
- B. Unless indicated otherwise, place chamfer strips in corners of forms to produce beveled edges on permanently exposed exterior corners.
- C. To maintain specified finish tolerances, camber formwork to compensate for anticipated deflections.
- D. Provide positive means of adjustment using wedges, jacks, Shores, and struts to take up all settlement during concrete placing operation.
- E. Provide temporary ports in formwork to facilitate cleaning and Inspection. Locate openings at bottom of forms to allow flushing water to drain.
- F. At construction joints, overlap forms over hardened concrete at least six (6) inches. Hold forms against hardened concrete to prevent offsets or loss of mortar at construction joint and to maintain true surface.
- G. Construct wood forms for wall openings to facilitate loosening, or counteract swelling.
- H. Fasten wedges used for final adjustment of forms before concrete placement in position after final check.
- I. Anchor formwork to Shores, supporting surfaces or members to prevent upward or lateral movement and deflection of any part of formwork system during concrete placement.
- J. Provide runways for moving equipment with struts or legs, supported directly on formwork or structural member without resting on reinforcing.
- K. Position expansion joint material and other embedded items accurately and support to prevent displacement.
- L. To prevent entry of concrete, fill voids in sleeves, inserts, and anchor slots temporarily with readily removable material.
- M. For architectural concrete, limit deflection of facing materials between studs as well as deflection of studs and walers to 0.0025 times span.

- N. For underground concrete work, do not use soil walls for forming unless authorized by ENGINEER.

### 3.3 INSERTS, EMBEDDED PARTS, AND OPENINGS

- A. Provide formed openings for elements embedded in or passing through concrete.
- B. Coordinate work of other sections for the forming and setting of openings, slots, recesses, chases, sleeves, bolts, anchors, and other inserts.
- C. Install accessories per manufacturer's instructions. Ensure items are not disturbed during concrete placement.

### 3.4 FORM FINISHES

- A. Use forms with smooth rubbed, scrubbed, sand floated finishes that meet ACI 347 unless indicated otherwise.
- B. For As-cast Finishes:
  - 1. Install form panels in orderly arrangement with joints planned in approved relation to building elements.
  - 2. Where panel joints are recessed or otherwise emphasized, locate form ties within joints, not within panel areas.
  - 3. Where an as-cast finish is required, no grouting will be permitted in the finishing operation.
- C. Textured Finishes: As indicated.

### 3.5 APPLICATION OF FORM RELEASE AGENT

- A. Apply form release agent on formwork per manufacturer's instructions. Apply before placing reinforcing steel, anchoring devices, and embedded items.

### 3.6 FORM REMOVAL

- A. Do not pry against face of concrete. Use only wooden wedges.
- B. When repair of surface defects or finishing is required at an early age, remove forms as soon as concrete has hardened sufficiently to resist damage from removal operations.
- C. Remove top forms on sloping surfaces of concrete as soon as concrete has attained sufficient stiffness to prevent sagging. Perform needed repairs or treatment required on such sloping surfaces at once, followed by specified curing.
- D. Loosen wood forms for wall openings as soon as it can be accomplished without damage to concrete.
- E. Formwork for columns, walls, sides of beams, and other members not supporting weight of concrete may be removed as soon as concrete has hardened sufficiently to resist damage from removal.
- F. Where no Reshoring is planned, leave forms and Shoring used to support weight of concrete in beams, slabs, and other concrete members in place until concrete has attained its specified strength.
- G. Where Reshoring is planned, supporting formwork may be removed

when concrete has reached 70 percent of specified strength, provided Reshoring is installed immediately.

- H. When Shores and other vertical supports are so arranged that non-load carrying, form-facing material may be removed without loosening or disturbing Shores and supports, facing material may be removed at an earlier age.

### 3.7 RESHORING

- A. When Reshoring is permitted or required, plan operations in advance and obtain approval.
- B. During Reshoring do not subject concrete in beam, slab, column, or any other structural member to combined dead and construction loads and live loads in excess of loads permitted for developed concrete strength at time of Reshoring.
- C. Place Reshores as soon as practical after stripping operations are complete, but in no case later than end of working day on which stripping occurs.
- D. Tighten Reshores to carry required loads without over-stressing.
- E. Leave Reshores in place until the concrete being supported has reached its specified strength.
- F. For floors supporting Shores under newly placed concrete, level original supporting Shore or Reshore:
  - 1. Reshoring system shall have a capacity to resist anticipated loads in all cases equal to at least 1/2 the capacity of the Shoring system.
  - 2. Unless otherwise specified locate Reshores directly under a Shore.
  - 3. In multistory buildings, extend Reshoring through a sufficient number of stories to distribute the weight of newly placed concrete, forms, and construction live loads in such a manner that design loads of floors and supporting Shores are not exceeded.
- G. Design, engineering, and construction of Shoring and Reshoring is the responsibility of the CONTRACTOR.

### 3.8 REMOVAL STRENGTH

- A. When removal of formwork or Reshoring is based on concrete reaching a specified strength, it shall be assumed that concrete has reached this strength when either of the following conditions has been met:
  - 1. When test cylinders, field cured along with the concrete they represent, have reached the specified strength.
  - 2. When concrete has been cured per Section 03 39 00 for the same length of time as the site-cured cylinders that reached specified strength. Determine the length of time the concrete has been cured in the structure by cumulative number of days or fractions thereof, not necessarily consecutive, during which the air temperature is above 50 deg F and concrete has been damp or sealed from evaporation and loss of moisture.

**3.9 REUSE OF FORMS**

- A. Do not reuse forms if there is any evidence of surface wear or defect which would impair quality of concrete surface.
- B. Thoroughly clean and properly coat forms before reuse.

**3.10 FIELD QUALITY CONTROL**

- A. Before commencing a pour, verify connections, form alignment, ties, inserts and Shoring are placed and secure.
- B. Observe formwork continuously while concrete is being placed to verify that the forms are plumb and there are no deviations from desired elevation, alignment, or camber.
- C. If during construction any weakness develops and false-work shows undue settlement or discoloration, stop work, remove affected construction if permanently damaged, and strengthen false-work.

END OF SECTION

**SECTION 03 20 00**  
**CONCRETE REINFORCING**

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**PART 1 GENERAL**

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**1.1 SECTION INCLUDES**

- A. Reinforcing steel bars, wire fabric or rod mats for cast-in-place concrete.
- B. Support chairs, bolsters, bar supports, and spacers for supporting reinforcement.

**1.2 REFERENCES****A. AASHTO Standards:**

M254 Corrosion Resistant Coated Dowel Bars.

**B. ACI Standards:**

301 Structural Concrete for Buildings.

315 Concrete Reinforcement.

**C. ASTM Standards:**

A82 Steel Wire, Plain, for Concrete Reinforcement.

A185 Steel Welded Wire, Fabric, Plain, for Concrete Reinforcement.

A615 Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.

A706 Low-Alloy Steel Deformed Bars for Concrete Reinforcement.

C1116 Fiber-Reinforced Concrete and Shotcrete.

D3963 Epoxy-Coated Reinforcing Steel.

**D. AWS Standards:**

D1.1 Structural Welding Code Steel.

D1.4 Structural Welding Code Reinforcing Steel.

**E. CRSI Standards:**

Manual of Standard Practice.

**1.3 SUBMITTALS**

- A. **Manufacturer's Certificate:** Submit mill test certificates of supplied concrete reinforcement, indicating physical and chemical analysis.
- B. **Welder's certification.**



**C. Shop Drawings:**

1. Indicate sizes, spacings, locations, and quantities of reinforcing steel, wire fabric, bending and cutting schedules, splicing, stirrup spacing, supporting, and spacing devices.
2. When required, prepare Shop Drawings by an engineer who complies with Utah licensing law and is acceptable to agency having jurisdiction.

**1.4 QUALITY ASSURANCE**

- A. Perform concrete reinforcement work per CRSI Manual of Standard Practice.
- B. Comply with ACI 301.
- C. Welders: Certified to comply with AWS D1.1 or AWS D1.4 as applicable.

**1.5 ACCEPTANCE**

- A. Unless specified otherwise, chairs for supporting reinforcement in flat slabs are spaced as follows:
  1. Three (3) feet maximum for No. 5 and smaller bars.
  2. Five (5) feet maximum for bars larger than No. 5.
- B. Dowels are placed on dowel baskets and properly aligned.
- C. Epoxy and galvanized coatings are not chipped or cut. Ends of cut bars are epoxy coated or galvanize painted before placement.
- D. Minimum covering over reinforcement is as specified.

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**PART 2 PRODUCTS**

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**2.1 MATERIALS**

- A. Fiber Reinforcement: Glass, ASTM C1116.
- B. Reinforcement:
  1. Grade 60 ksi deformed steel bars, ASTM A615 and supplementary requirements S1 or ASTM A706 for welding.
  2. Welded wire fabric. Plain steel type, ASTM A185 in flat sheets or coiled rolls. Dimensions of the mesh 4"x 4" or as indicated.
- C. Stirrups: Steel, ASTM A82.
- D. Dowel Bars for Expansion Joints: Grade 60 ksi smooth steel bar, ASTM A615.
  1. Galvanized or epoxy coated in roadway Pavements.
  2. Provide plastic cap to permit longitudinal movement of dowel bar within concrete section equal to joint width plus 1/4 inch.
  3. For load transfer joints, paint bars with 1 coat of paint conforming to AASHTO M254 and coat 1/2 with grease.

- E. Coatings for Corrosion Protection:
  - 1. Epoxy coat, ASTM D3963.
  - 2. Galvanized, Section 05 05 10.

## 2.2 ACCESSORY MATERIALS

- A. Tie Wire: Minimum 16 gage annealed type or an acceptable patented system.
- B. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during installation and placement of concrete.

## 2.3 FABRICATION

- A. Fabricate reinforcement, ACI 315 providing for concrete cover.
- B. Locate reinforcing splices not indicated on Drawings at points of minimum stress. Indicate location of splices on Shop Drawings.
- C. Weld reinforcing bars; with AWS D1.4.

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# PART 3 EXECUTION

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## 3.1 PLACING

- A. All reinforcement to be free of loose mill scale, loose or thick rust, dirt, paint, oil or grease.
- B. Place all reinforcement in the exact position indicated. With tie wire, tie bars together at all intersections except where spacing is less than 12 inches in each direction, in which case tie alternate intersections.
- C. Maintain the distance from vertical forms and between layers of reinforcement by means of prefabricated chairs, ties, hangers, or other approved devices. Placing and fastening of reinforcement in each section of the Work must be approved before concrete is placed.
- D. Overlap sheets of metal mesh one square plus six (6) inches to maintain a uniform strength. Securely fasten at the ends, edges, and supports to maintain clearances.
- E. Flat Slab Work:
  - 1. Support reinforcing steel of formed flat slabs with plastic chairs, precast concrete blocks or other non-oxidizing slab bolsters.
  - 2. Size chairs or bolsters to position the steel in the exact location indicated.
  - 3. Space chairs and bolsters not more than five (5) feet on centers in each direction.
  - 4. Coat metal supports in contact with forms to prevent rust.
  - 5. Tie down deck steel to beams or forms at regular intervals of not more than five (5) feet on centers along the beams or forms to prevent movement of steel during concrete placement.

**3.2 SPLICING**

- A. Furnish all reinforcement in the full lengths indicated unless otherwise permitted. Splicing of bars, except where indicated is not permitted without ENGINEER's knowledge. Stagger splices where possible.
- B. Unless indicated otherwise, overlap reinforcing bars a minimum of 30 diameters to make the splice. In lapped splices, place the bars and wire to maintain the minimum distance for clear spacing to the surface of the concrete.
- C. Do not use lap splices on bars greater than No. 11 diameter unless approved.
- D. Weld reinforcing steel only if indicated or if authorized in writing. Weld in conformance to AWS D1.4.
- E. Do not bend reinforcement after embedding in hardened concrete.
- F. Do not permit reinforcement or other embedded metal items bonded to the concrete, to extend continuously through any expansion joint, except dowels in floors bonded on only one side of joints.

**3.3 PLACING EMBEDDED ITEMS**

- A. Place all sleeves, inserts, anchors and embedded items before concrete placement. Temporarily fill voids in embedded items to prevent entry of concrete.
- B. Give all trades whose work is related to the concrete section (Section 03 30 04) ample notice and opportunity to introduce or furnish embedded items before concrete placement.

END OF SECTION

**SECTION 03 30 04  
CONCRETE**

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**PART 1 GENERAL**

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**1.1 SECTION INCLUDES**

- A. Material requirements.

**1.2 REFERENCES****A. ACI Standards:**

- 211.1 Selecting Proportions for Normal, Heavyweight, and Mass Concrete.
- 211.2 Selecting Proportions for Structural Lightweight Concrete.
- 211.3 Standard Practice for Selecting Proportions for No-Slump Concrete.
- 214 Evaluation of Strength Test Results of Concrete.
- 301 Specifications for Structural Concrete for Buildings.
- 305 Hot Weather Concreting.
- 306 Cold Weather Concreting.
- 318 Building Code Requirements for Reinforced Concrete.

**B. ASTM Standards:**

- C33 Concrete Aggregates.
- C39 Compressive Strength of Cylindrical Concrete Specimens.
- C88 Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
- C94 Ready-Mixed Concrete.
- C117 Material Finer than 75 $\mu$  (No. 200) Sieve in Mineral Aggregates by Washing.
- C123 Lightweight Particles in Aggregate.
- C138 Unit Weight, Yield, and Air Content (Gravimetric) of Concrete.
- C142 Clay lumps and Friable Particles in Aggregates.
- C143 Slump of Hydraulic-Cement Concrete.
- C150 Portland Cement.
- C172 Sampling Freshly Mixed Concrete.
- C227 Potential Reactivity of Cement-Aggregate Combinations (Mortar Bar Method).
- C231 Air Content of Freshly Mixed Concrete by the Pressure Method.

- C260 Air-Entraining Admixtures for Concrete.
- C289 Potential Reactivity of Aggregates (Chemical Method).
- C295 Petrographic Examination of Aggregates for Concrete.
- C441 Effectiveness of Mineral Admixtures or Ground Blast-Furnace Slag in Preventing Excessive Expansion of Concrete Due to The Alkali-Silica Reaction.
- C494 Chemical Admixtures for Concrete.
- C535 Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
- C595 Blended Hydraulic Cements.
- C618 Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.
- C1064 Temperature of Freshly Mixed Portland Cement Concrete.
- C1077 Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.
- C1116 Fiber-Reinforced Concrete and Shot Crete.
- C1157 Blended Hydraulic Cement.
- C1240 Use of Silica Fume as a Mineral Admixture in Hydraulic Cement Concrete, Mortar, and Grout.
- C1260 Potential Alkali Reactivity of Aggregates (Mortar-Bar Method).
- C1293 Concrete Aggregates by Determination of Length Change of Concrete Due to Alkali-Silica Reaction.
- C1567 Determining the Potential Alkali-Silica Reactivity of Combinations of Cementitious Materials and Aggregate (Accelerated Mortar-Bar Method).
- C1602 Mixing Water Used in The Production of Hydraulic Cement Concrete.

STP 15-C Manual on Quality Control of Materials.

### 1.3 SUBMITTALS

#### A. **Quality Assurance:**

1. Independent Laboratory: Submit names, certification levels, and years of experience of testing agency's field technicians that are assigned to the Work. Verify laboratory complies with ASTM and ACI standards.
2. Mixing Equipment: Submit certification of plant equipment.

#### B. **Mix Design:** Allow ENGINEER 10 days to evaluate the submittal. Provide the following information.

1. Date of mix design. If older than 365 days from date of submission recertify mix design.
2. Physical properties of the aggregate (this section article 2.3). Test results shall not be older 455 days from the date of submission. The

information is for suitability of source and not for project control. A new report may be required if aggregate source is changed.

3. Identify whether mix is for hot, cold, or normal weather placement.
  4. Cement source, type and chemical composition.
  5. Aggregate soundness and potential reactivity.
  6. Average Strength ( $f_{cr}$ ), per quality control chart.
  7. Allowable range of slump and air content.
  8. Water cement ratio.
  9. Proportions of materials in the mix.
  10. Unit weight.
  11. Analysis of water if water is not potable.
  12. Mortar bar or prism test results if a pozzolan is included in the mix.
  13. Technical data sheets for additives to be used at the plant and at the job site. Certify additives are compatible with each other.
- C. **Pre-approved Mix Design:** Submit name and address of Supplier and Suppliers mix design number if available.
- D. **Before Changing Mix Design:** Submit a new design and allow ENGINEER 10 days to evaluate the changes.

#### 1.4 QUALITY ASSURANCE

A. **General:**

1. Use a laboratory that follows and complies with ASTM C1077.
2. Reject concrete that does not meet requirements of this section.
3. If requested, submit a quality control and testing report describing source and field quality assurance activities performed by CONTRACTOR and Suppliers.

B. **At Source:**

1. Do not change material sources, type of cement, air-entraining agent, water reducing agent, other admixtures except as allowed by mix design.
2. Store bagged and bulk cement in weatherproof enclosures. Exclude moisture and contaminants.
3. Prevent segregation and contamination of aggregate stockpiles.
4. Avoid contamination, evaporation, or damage to admixtures. Protect liquid admixtures from freezing.

- C. **At Site:** Use of admixtures will not relax hot or cold weather placement requirements.

1.5 ACCEPTANCE

A. **Materials:**

- 1. Aggregate Source:
  - a. Verify suitability of aggregate source.
  - b. Verify aggregate gradation.
  - c. Verify percent of combined aggregate passing No. 200 sieve.
- 2. At the Site:
  - a. Verify mix identification, batch time, slump, air content, and temperature.
  - b. Verify drum rotation is less than 300 revolutions.
- 3. At the Laboratory: Verify strength in 28 days.

B. **Defective Material:** Popouts, scaling, etc.

- 1. Price adjustment, Section 01 29 00 and Section 03 30 10.
- 2. Dispute resolution, Section 01 35 10.

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**PART 2 PRODUCTS**

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2.1 CEMENT

A. **General:**

- 1. Do not use air entraining cement except for hand mixed applications.
- 2. Do not use cement containing lumps or is partially set.
- 3. Do not mix cement originating from different sources.

B. **Standard Set Cement:**

- 1. Type II cement per tables 1 and 3 in ASTM C150, or Type V when necessary, or
- 2. Low-alkali cement per Table 2 in ASTM C150.

C. **Blended Hydraulic Cement:** The following are cement equivalencies when substituting blended cement for a Portland cement.

| Table 1 – Cement Equivalencies |                |            |
|--------------------------------|----------------|------------|
| Portland Cement<br>ASTM C150   | Blended Cement |            |
|                                | ASTM C595      | ASTM C1157 |
| Type I                         | IP             | GU         |
| Type II                        | IP (MS)        | MS         |
| Type III                       | --             | HE         |
| Type IV                        | --             | --         |
| Type V                         | --             | HS         |

D. **Rapid Set Cement:** As above and as follows:

- 1. Initial set time: 15 minutes minimum.

2. Color: Acceptable to the ENGINEER.

2.2 WATER

- A. Clean, non-staining, non-detrimental per ASTM C1602.
- B. Screen out extraneous material.
- C. Do not use alkali soil water.

2.3 AGGREGATES

- A. Gravel, crushed gravel, crushed stone, crushed concrete, slag, sand or combination with the following physical properties.

| Table 2 – Physical Properties  |                                 |          |     |      |
|--|---------------------------------|----------|-----|------|
|  |                                 | Standard | Min | Max  |
| Coarse Aggregate   |                                 |          |     |      |
| Wear (hardness or toughness), percent (a)  |                                 | (a)      | --  | 50   |
| Soundness (5 cycles), percent  | Na <sub>2</sub> SO <sub>4</sub> | C88      | --  | 12   |
|  | Mg <sub>2</sub> SO <sub>4</sub> | C88      | --  | 18   |
| Coal and lignite (SG = 2.4 min.), percent (b)  |                                 | C123     | 0.5 | 1.0  |
| Clay lumps, friable particles, chert, percent  |                                 | C142     | --  | 7    |
| Material finer than 200 sieve, percent   |                                 | C117     | --  | 1.0  |
| Fine Aggregate   |                                 |          |     |      |
| Soundness (5 cycles), percent  | Na <sub>2</sub> SO <sub>4</sub> | C88      | --  | 10   |
|  | Mg <sub>2</sub> SO <sub>4</sub> | C88      | --  | 15   |
| Fineness modulus   |                                 | C33      | 2.3 | 3.1  |
| Coal and lignite (SG = 2.4 min.), percent (b)  |                                 | C123     | 0.5 | 1.0  |
| Clay lumps, friable particles, chert, percent  |                                 | C142     | --  | 3.0  |
| Aggregate blend (meets one of the following)   |                                 |          |     |      |
| 1. Average prism length change in 12 months, percent (c)   |                                 | C1293    | --  | 0.04 |
| 2. Average mortar bar length change in 16 days, percent (c)  |                                 | C1260    | --  | 0.10 |
| 3. Petrography limits, percent   |                                 |          |     |      |
| Quartz.....(d)   |                                 | C295     | --  | 5.0  |
| Chert or chalcedony .....  |                                 |          | --  | 3.0  |
| Tridymite or cristobalite.....   |                                 |          | --  | 1.0  |
| Opal.....  |                                 |          | --  | 0.5  |
| Natural glass in volcanic rock .....   |                                 |          | --  | 3    |
| 4. Historical data acceptable to ENGINEER  |                                 |          |     |      |
| NOTES  |                                 |          |     |      |
| (a) Wear retained on No. 8 sieve. For aggregate less than 1 1/2" use ASTM C131. For larger aggregates use ASTM C535. |                                 |          |     |      |
| (b) Organic impurities producing a dark color concrete may cause rejection.  |                                 |          |     |      |
| (c) Prism length change and mortar bar length change based upon unmodified ASTM tests.                               |                                 |          |     |      |
| (d) Quartz must NOT be optically strained, micro-fractured, or microcrystalline in nature.                           |                                 |          |     |      |



## 2.4 ADDITIVES

- A. Calcium Chloride: Not allowed in reinforced concrete.
- B. Air Entrainment: ASTM C260. For extrusion enhancement use non-vinsal resin.
- C. Set Enhancement and Water Reducing Agents: ASTM C494.
  - 1. Type A: Water reducing.
  - 2. Type B: Set retarding.
  - 3. Type C: Set accelerating.
  - 4. Type D: Water reducing and set retarding.
  - 5. Type E: Water reducing and set accelerating.
  - 6. Type F: High range water reducing (super plasticizer). \*
  - 7. Type G: High range water reducing and set retarding. \*

\* Keep the relative durability factor of water reducing additives not less than 90 and the chlorides content (as Cl<sup>-</sup>) not exceeding 1 percent by weight of the admixtures.
- D. Pozzolan:
  - 1. Natural or fly ash per ASTM C618.
  - 2. Silica fume per ASTM C1240.
- E. Special Admixtures: Allowed if mix design submittal is accepted:
  - 1. Lithium nitrate based solution for control of reactive aggregates.
  - 2. Calcium nitrite based solution for corrosion protection of reinforced structures subject to chloride-induced corrosion.
  - 3. Shrinkage reducer for controlling drying shrinkage in concrete.
  - 4. Viscosity modifier for enhancement of self consolidating concrete or for workability.

## 2.5 MIX DESIGN

- A. **Class:** Unless specified elsewhere, as follows.
  - 1. Above Ground: 5000 minimum.
  - 2. At Ground Level: 4000 minimum.
  - 3. Underground: 4000 minimum.
- B. **Selection of Cement:** ASTM C150 or C1157.
  - 1. For sulfate resistance, use Type V Portland cement, or Type II with Class F fly ash. Class F fly ash may be used as an addition to Type V Portland cement.
  - 2. Do not use fly ash with Type IP(MS) or Type III Portland cement.
- C. **Selection of Aggregates:**
  - 1. Maximum Particle Size:
    - a. 1/5 of narrowest dimension between forms.
    - b. 1/3 of depth of slab.

- c. 3/4 of minimum clear spacing between reinforcing bars.
- 2. Gradation: ASTM C33.
  - a. Coarse Aggregate: Choose from the following grades.  
Gradations are based upon percent of material passing sieve by weight.

| <b>Table 3 – Coarse Aggregate Gradation</b> |                 |                   |                |                  |
|---|-----------------|-------------------|----------------|------------------|
| <b>Sieve</b>                                | <b>Grade</b>    |                   |                |                  |
|   | <b>357 (2")</b> | <b>467 (1.5")</b> | <b>57 (1")</b> | <b>67 (3/4")</b> |
| 2-1/2"                                      | 100             | --                | --             | --               |
| 2 Inch                                      | 95 - 100        | 100               | --             | --               |
| 1-1/2"                                      | --              | 95 - 100          | 100            | --               |
| 1"  | 35 - 20         | --                | 95 - 100       | 100              |
| 3/4"  | --              | 35 - 70           | --             | 90 - 100         |
| 1/2"  | 10 - 30         | --                | 25 - 60        | --               |
| 3/8"  | --              | 10 - 30           | --             | 20 - 55          |
| No. 4                                       | 0 - 5           | 0 - 5             | 0 - 10         | 0 - 10           |

- b. Fine Aggregate:

| <b>Table 4 – Fine Aggregate Gradation</b> |                                  |
|---|----------------------------------|
| <b>Sieve</b>                              | <b>Percent Passing by Weight</b> |
| 3/8"                                      | 100                              |
| No. 4                                     | 95 to 100                        |
| No. 16                                    | 45 to 80                         |
| No. 50                                    | 10 to 30                         |
| No. 100                                   | 2 to 10                          |

- c. Silts and Clays: The amount of material smaller than the No. 200 sieve in any combined gradation sample is limited to the following percentages by weight of the combined sample:
  - 1) 1.75 percent maximum for concrete subject to abrasion.
  - 2) 3.0 percent maximum for all other concrete.

#### **D. Selection of Pozzolan:**

- 1. General: If a blended aggregate passes an unmodified ASTM C1293 test, use of a pozzolan is CONTRACTOR's choice. If aggregate does not pass ASTM C1293, select a pozzolan (or blended cement, or both) and determine the effective dosage to meet one of the following tests:
  - a. ASTM C1567. The expansion of a cement-pozzolan-aggregate job-mix mortar bar is less than or equal to 0.10 percent at 16 days. Do not use this test if a lithium admixture is used in the job-mix.
  - b. ASTM C441. The expansion of a test mixture at 56 days is less than or equal to a control mixture prepared with cement with equivalent alkalis between 0.5 and 0.6 percent.

2. Fly Ash (Class F): Allowed as a cement replacement under the following conditions:
    - a. Before replacement is made, use the minimum cement content in the design formula to establish the water/cement ratio.
    - b. Replace up to 20 percent of the cement by weight on a one (1) part fly ash to one (1) part cement basis.
    - c. Submit to ENGINEER a quality history of the fly ash identifying a minimum of 20 of the most current ASTM C618 analysis.
  3. Natural Pozzolan (Class N): Allowed as a cement replacement if the 14 day expansion test (ASTM C1567) with job aggregates, job cement and natural pozzolan does not exceed the 14 day expansion test of job aggregates, job cement and Class F fly ash.
  4. Silica Fume: Allowed as a cement replacement if replacement of hydraulic cement on a 1 part silica fume to 1 part cement does not exceed 10 percent, and water/cement ratio is established before cement is replaced with silica fume.
- E. **Selection of Mix Properties:** Select and proportion the mix to produce appropriate strength, durability and workability. Use ACI 211.1, 211.2, or 211.3, and meet the following properties and limitations:

| Table 5 – Mix Properties and Limitations   |        |          |            |            |            |      |
|--|--------|----------|------------|------------|------------|------|
| Properties   |        | Standard | Class      |            |            |      |
|  |        |          | 2000       | 3000       | 4000       | 5000 |
| Compressive Strength ( $f_c'$ ) at 28 days, psi, minimum   |        | C39      | 2000       | 3000       | 4000       | 5000 |
| Compressive Strength at 7 days, psi, (for reference only)  |        | C39      | 1340       | 2010       | 2680       | 3350 |
| Average Strength, psi ( $f_{cr}$ )   |        | 214      | (a)        | (a)        | (a)        | (a)  |
| Cement content, bags, minimum (b)  |        | --       | 4.5        | 5.5        | 6.5        | 7.5  |
| Water-cement ratio (by weight), maximum (c)  |        | 318      | (d)        | (d)        | 0.44       |      |
| Entrained air, percent (based upon aggregate size) (e)   | 2"     | C231     | 3.0 to 6.0 | 4.5 to 7.5 | 4.0 to 7.0 |      |
|  | 1-1/2" |          | "          | "          | 4.5 to 7.5 |      |
|  | 1"     |          | "          | "          | 5.0 to 7.5 |      |
|  | 3/4"   |          | "          | "          | 5.0 to 7.5 |      |
| Slump  |        | C143     | (d)        | (d)        | (d)        | (d)  |
| NOTES<br>(a) The amount by which average strength ( $f_{cr}$ ) exceeds compressive strength ( $f_c'$ ) is based upon statistical assurance that no more than 1 test in 100 tests will fall below compressive strength ( $f_c'$ ).<br>(b) Unless allowed otherwise by ENGINEER.<br>(c) Before pozzolan substitution.<br>(d) Specific to exposure conditions and finishing need.<br>(e) Comply with ACI 211.1 if air content is changed.<br>(f) 1 bag of cement = 94 pounds. |        |          |            |            |            |      |

1. Cold Weather: ACI 306. Unless allowed otherwise by ENGINEER, increase cement content in the mix design by 1 class between **October 1 and March 1**, i.e. Class 3000 becomes Class 4000, Class 4000 becomes Class 5000, etc.
  2. Hot Weather: ACI 305. Reduce temperature of mix ingredients or use an admixture appropriate to job conditions when air temperature is over 75 deg F.
  3. Concrete Deposited Under Water: Increase cement content one (1) class for concrete placed above water or use viscosity modifying admixture.
- F. **Selection of Fiber Reinforcement:** The basis for determining material proportions of fiber-reinforced concrete is the Supplier's responsibility per ASTM C1116 subject to mix property requirements of this Section. Unless specified otherwise provide synthetic fibers.

## 2.6 SOURCE QUALITY CONTROL

- A. **General:** Collect Samples randomly. Do not change source quality control sampling point.
- B. **Aggregate:**
1. Soundness, ASTM C88.
  2. Alkali-silica reactivity, ASTM C289, C1567, C1260, C227 and C1293.
  3. Petrographically examine fine and coarse aggregate sources once every three (3) years, ASTM C295.
- C. **Concrete Mix:** Obtain samples per ASTM C172 and run the following tests:
1. Compressive strength, ASTM C39.
  2. Unit weight, ASTM C138.
  3. Slump, ASTM C143.
  4. Air, ASTM C231.
  5. Temperature, ASTM C1064.
- D. **Concrete Quality Charts:** Comply with ACI 214 and ACI 301. Plot new results and identify trends on quality control charts that comply in form to ASTM STP 15-C. Show the Specified Strength ( $f'_c$ ), the required Average Strength ( $f_{cr}$ ), and the compressive strength versus date of Sample.
- E. **Equipment:** Certify at least every two (2) years through the services of a design professional licensed in the State of Utah, that plant equipment complies with requirements of the National Ready Mixed Concrete Association and ASTM C94.
1. Transit Trucks: Equip transit trucks with plates indicating total volume, agitating volume and mix volume.
  2. Weights and Measures: Comply with regulatory requirements of State of Utah.

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**PART 3 EXECUTION**

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**3.1 INSTALLATION**

- A. Placement, Section 03 30 10.

**3.2 FIELD QUALITY CONTROL**

- A. Truck Mixed Concrete (Dry Batch): ASTM C94.
1. Truck Mixer: Fill drum no more than 63 percent of the gross drum volume and no less than two (2) cubic yards. Use drum manufacturer's recommended mixing speed (between 12 – 18 rpm).
  2. Truck Agitator: Do not fill drum greater than 80 percent of the gross drum volume. Use drum manufacturer's recommended agitating speed (between 2 – 6 rpm).
- B. Mixing Plant: ASTM C94.
1. Use option C and requirements in this Section for preparing ready-mixed concrete.
  2. Use scales certified by the State of Utah. Do not use volume measurement except for water and liquid admixtures.
  3. Mixing time must exceed 80 seconds after adding air entrainment admixture.
- C. Hand Mixing:
1. Do not hand mix batches larger than 0.5 cubic yard.
  2. Hand mix only on a watertight platform.
  3. Ensure all stones are thoroughly covered with mortar and mixture is of uniform color and consistency before adding water.

END OF SECTION

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**SECTION 03 30 05**  
**CONCRETE TESTING**

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**PART 1 GENERAL**

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**1.1 SECTION INCLUDES**

- A. Concrete sampling and testing requirements.

**1.2 REFERENCES**

A. **ACI Standards:**

- 318 Building Code Requirements for Reinforced Concrete.

B. **ASTM Standards:**

- C31 Making and Curing Concrete Test Specimens in the Field.  
C39 Compressive Strength of Cylindrical Concrete Specimens.  
C42 Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.  
C78 Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading).  
C136 Standard Method for Sieve Analysis of Fine and Coarse Aggregates.  
C138 Unit Weight, Yield, and Air Content (Gravimetric) of Concrete.  
C143 Slump of Portland Cement Concrete.  
C172 Sampling Freshly Mixed Concrete.  
C173 Air Content of Freshly Mixed Concrete by Volumetric Method.  
C231 Air Content of Freshly Mixed Concrete by the Pressure Method.  
C567 Unit Weight of Structural Lightweight Concrete.  
C1064 Temperature of Freshly Mixed Portland Cement Concrete.  
C1077 Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.

**1.3 SUBMITTALS**

- A. **Concrete Supplier:** If requested, submit reports and material certificates verifying concrete quality control.
- B. **Laboratory:** Promptly submit test data results for seven (7) and 28 day breaks to Supplier, CONTRACTOR and ENGINEER.

#### 1.4 QUALITY ASSURANCE

- A. Provide an ASTM C1077 compliant and ACI certified laboratory.
- B. Provide level I ACI certified field sampling technicians.

#### 1.5 SITE CONDITIONS

- A. **Assist ENGINEER:** Furnish labor to assist ENGINEER in obtaining and handling acceptance Samples at site or sources.
- B. **Store and Cure Test Specimens:** Safely store and cure concrete test specimens and acceptance test specimens for first 24 hours:
  - 1. Follow ASTM C31 in making and curing cylinders or beams at site. Do not move the cylinders or beams for the initial 16 hour cure period. Provide initial cure temperature as follows:
    - a. 60 to 80 deg F for Class 4,000 or less.
    - b. 68 to 78 deg F for Class 5,000 or greater.
  - 2. Equip storage device with an automatic 24 hour temperature recorder with an accuracy of plus or minus two (2) deg F
  - 3. Use water containing hydrated lime if water is to be in contact with cylinders or beams.
  - 4. Ensure the device(s) can accommodate the required number of test cylinders or beams. Lack of capacity will cause the placement of concrete to cease.
  - 5. Have the storage devices available at the point of placement at least 24 hours before placement.
  - 6. A 24 hour test run may be required.

#### 1.6 ACCEPTANCE

- A. At the Laboratory:
  - 1. Compressive strength, ASTM C31.
  - 2. Flexure strength, ASTM C78.
- B. At the Site:
  - 1. Acceptance: Reject non-complying batches until two (2) consecutive batches are compliant then proceed in random batch testing for acceptance.
  - 2. Sampling Protocol: ASTM C172. Unless indicated otherwise follow Table 1 sampling frequency requirements. Collect sample at discharge chute before placement, or at pumper hose after priming grout has been wasted.

| <b>Table 1 – Sampling Frequency</b>               |                    |            |              |                           |
|---|--------------------|------------|--------------|---------------------------|
| <b>Rate of Placement<br/>(Cubic Yard / Day)</b>   | <b>Temperature</b> | <b>Air</b> | <b>Slump</b> | <b>Strength</b>           |
| 0 - 8   | 1                  | 1          | 1            | Determined by<br>ENGINEER |
| 0 - 50  | 1                  | 1          | 1            | 1                         |
| Each additional 50 cu.<br>yd. or fraction thereof | 1                  | 1          | 1            | 1                         |

3. Testing Protocol:
  - a. Temperature, ASTM C1064.
  - b. Air content, ASTM C231 or ASTM C173 if lightweight aggregate is used.
  - c. Slump, ASTM C143.

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## **PART 2 PRODUCTS**

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Not Used

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## **PART 3 EXECUTION**

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### **3.1 PRECAST PRODUCTS**

- A. Obtain composite Samples from different portions of the batch.
- B. Make and cure concrete test specimens for acceptance, ASTM C31.
- C. Cure all precast products with water vapor or water.
- D. Do not damage precast products by stripping forms or handling before the concrete reaches its specified strength.

### **3.2 CAST-IN-PLACE PRODUCTS**

- A. Obtaining Samples:
  1. Batch samples, ASTM C172.
  2. Core samples, ASTM C42.
- B. Identify location of tests on test reports.
- C. Compressive strength, ASTM C39:
  1. Mold four (4) test specimens, ASTM C31.
  2. For strength test perform slump, air, unit weight, and temperature test.
  3. Break 1 cylinder at seven (7) days and three (3) cylinders at 28 days. The average strength of three (3) cylinder breaks shall be considered the test result.



4. If any one cylinder in a 28 days test shows definite evidence of improper sampling, molding, handling, curing, or testing, discard the cylinder. The average strength of the remaining cylinders shall be considered the test result.
- D. Tensile (flexural) strength, ASTM C78:
  1. Mold four (4) test specimens, ASTM C31.
  2. For strength test perform slump, air, unit weight, and temperature test.
  3. Break 1 beam at seven (7) days and three (3) beams at 28 days. The average strength of the three (3) beam breaks shall be considered the test result.
  4. If any one beam in a 28 days test shows definite evidence of improper sampling, molding, handling, curing, or testing, discard the beam. The average strength of the remaining beams shall be considered the test result.
- E. Aggregate, ASTM C136 for fine and coarse aggregate.
- F. Slump test, ASTM C143.
- G. Air Test:
  1. Normal weight concrete, ASTM C231.
  2. Light weight concrete, ASTM C173.
- H. Unit Weight:
  1. Normal weight concrete, ASTM C138.
  2. Light weight concrete, ASTM C567.
- I. When requested, test in-place concrete by impact hammer, sonoscope, or other non-destructive device:
  1. To determine relative strengths in various locations in Work.
  2. To aid in evaluating concrete strength.
  3. To select areas to be cored.
  4. To verify quality control in the absence of control testing.

### 3.3 RETESTING DEFECTIVE CONCRETE STRENGTH

- A. If CONTRACTOR desires to do a retest, a request to ENGINEER for retesting must be made within 35 days from time of concrete placement. No coring or retesting shall be done after 40 days have elapsed from the time of placement:
  1. Choose three (3) random test locations and verify choice with ENGINEER. Obtain retest samples per ASTM C42 and test compressive strength per ASTM C39 or flexure strength per ASTM C78.
  2. Establish a chain of custody for all test samples.
  3. If concrete placed in the Work will be dry under service condition, air dry cores for seven (7) days before tests. Unless otherwise specified, use air temperature 60 to 80 deg F and relative humidity less than 60 percent.

4. If concrete placed in the Work will be more than superficially wet under service conditions, test cores after moisture conditioning (liquid or vapor water cure).
  5. If more than 1 core shows evidence of having been damaged before testing provide replacement cores, otherwise evaluation will be done on two (2) or more core samples.
  6. Evaluate cores in accordance with ACI 318 requirements.
  7. If core tests are inconclusive, or impractical to obtain, or if structural analysis does not confirm the safety of the Work, load test may be used and evaluated in accordance with ACI 318 requirements.
- B. Coat sides of core hole with concrete epoxy resin adhesive. Fill core holes with non-shrink concrete mortar. Match color and texture of surrounding concrete.
- C. Within 40 days from time of placement publish the chain of custody record and the results of retesting.

END OF SECTION

## SECTION 03 30 10 CONCRETE PLACEMENT

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### PART 1 GENERAL

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#### 1.1 SECTION INCLUDES

- A. Concrete placement for slabs on grade, slabs on fill, structural building frame, and other concrete components.

#### 1.2 REFERENCES

##### A. ACI Standards:

- 301 Structural Concrete for Buildings.
- 305 Hot Weather Concreting.
- 306 Cold Weather Concreting.
- 309 Consolidation of Concrete.

##### B. ASTM Standards:

- C881 Epoxy-Resin-Base Bonding Systems for Concrete.
- C1059 Latex Agents for Bonding Fresh to Hardened Concrete.

#### 1.3 SUBMITTALS

- A. **Batch Delivery Ticket:** For each batch delivered to site, identify:

1. Date and Project description.
2. Producer and plant.
3. Name of contractor.
4. Serial number of ticket.
5. Mix identification number or code.
6. Truck number and time dispatched.
7. Volume of concrete.
8. Type and amount of cement.
9. Total water and water/cement ratio.
10. Water added for receiver of concrete and receiver's initials.
11. Admixture types.
12. Separate weights of fine and coarse aggregate.
13. Statement of whether batch is pre-mixed at plant or mixed in transit.

- B. **Record of Placed Concrete:** Identify date of record, location of pour, quantity, air temperature, and CONTRACTOR's quality control test Samples taken.

- C. **Bonding Compound:** Identify product name, type, and chemical analysis.

**1.4 QUALITY ASSURANCE**

- A. Provide ACI certified finishers.
- B. Remove and replace any placed concrete suffering hot or cold weather damage.
- C. For control testing follow Section 03 30 05 requirements.

**1.5 ACCEPTANCE**

- A. General:
  - 1. Price adjustment, Section 01 29 00. CONTRACTOR may request ENGINEER determine appropriate Modifications or payment adjustments to pay for Defective work.
  - 2. Retesting by CONTRACTOR, Section 01 35 10 and Section 03 30 05.
- B. Concrete work that fails to meet any of the following requirements will be considered defective. Replace Defective Work at no additional cost to OWNER:
  - 1. Placement:
    - a. Reinforcing steel size, quantity, strength, position, damage, or arrangement is not as specified or does not comply with code.
    - b. Formwork differs from required dimensions or location in such a manner as to reduce concrete's strength or load carrying capacity or physical esthetics.
    - c. Workmanship likely to result in deficient strength.
  - 2. Finishing:
    - a. Concrete exposed to view has defects that adversely affect appearance.
    - b. Slab tolerances of Section 03 35 00 are not met.
  - 3. Protection:
    - a. Method of curing is not as specified.
    - b. Inadequate protection of concrete during early stages of hardening and strength development from:
      - 1) temperature extremes.
      - 2) rapid moisture loss.
    - c. Mechanical injury, construction fires, accidents, or premature removal of formwork likely to result in deficient strength development.

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**PART 2 PRODUCTS**

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## 2.1 MATERIALS

- A. Concrete: Section 03 30 04. Class as indicated:
  - 1. For roadway cuts, Section 33 05 25.
- B. Bonding Compound: ASTM C1059. Either polyvinyl acetate base or acrylic base latex:
  - 1. Use type I in areas not subject to high humidity or immersion in water with minimum bond strength of 400 psi.
  - 2. Use type II in areas subject to high humidity or immersion in water with minimum bond strength of 1250 psi.
- C. Vapor Retarder: 10 mil thick clear polyethylene sheet. Type recommended for below grade application.
- D. Forms: Section 03 11 00.
- E. Reinforcement: Section 03 20 00.
- F. Coverings and Curing Compound: Section 03 39 00.
- G. Shrinkage Compensating Grouts: Section 03 61 00.
- H. Epoxy Adhesive: Section 03 61 00.

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## PART 3 EXECUTION

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### 3.1 EXAMINATION

- A. Verify items to be cast into concrete are accurately placed and held securely.
- B. Verify slump, air content range, mix identity, and batch time on delivery ticket matches mix design.
- C. Verify slab steel mats are supported by steel chairs, precast concrete blocks, or other slab bolsters. Do not pour if absent.

### 3.2 PREPARATION

- A. Implement traffic control plan requirements, Section 01 55 26.
- B. Notify ENGINEER no later than 24 hours before commencement of concrete placement.
- C. Do not allow construction loads to exceed structural capacity.
- D. Clean previously placed concrete. Apply bonding compound per manufacturer's instructions.
- E. At locations where new concrete is dowelled to existing work, drill, remove dust, insert and pack steel dowels with shrink compensating grout, and expansion caps where required.

### 3.3 DELIVERY

- A. Concrete Temperature: Keep mixed concrete temperature before placement between 60 deg F. and 90 deg F.
- B. Slump and Air Content: Keep within allowable ranges.
- C. Transport Time:

| <u>Air Temperature</u> | <u>Time After Initial Batching</u> |
|------------------------|------------------------------------|
| Less than 90 deg F     | 1-1/2 hours                        |
| Greater than 90 deg F  | 1-hour (without retarder)          |
| Greater than 90 deg F  | 1-1/2 hours (with retarder)        |

To increase time past 1-1/2 hours, a hydration stabilizer that is acceptable to Supplier may be used.

- D. Tempering:
  - 1. Water may be added if all following conditions are met:
    - a. The mix design water/cement ratio is not exceeded.
    - b. The delivery ticket allows for addition of water based upon water/cement ratio.
    - c. The amount of water added is accurately measured to within 1 gallon of the design addition.
    - d. Water addition is followed by three (3) minutes of mixing at mixing speed before discharge.
    - e. Supplier and CONTRACTOR mutually agree on who is authorized to add water.
  - 2. **Do not add water after 1 cubic yard of concrete has discharged from the delivery vehicle.**
- E. Super-plasticizer: Comply with manufacturer's requirements. If none, then as follows:
  - 1. If added at site, add agent using injection equipment capable of rapidly and uniformly distributing admixture to concrete. Before discharge, mix for a minimum of five (5) minutes at a drum rate not less than 12 rpm or more than 15 rpm.
  - 2. If added at plant, do not deliver to site unless batch delivery ticket displays water/cement ratio before super-plasticizer addition.

### 3.4 CONCRETE PLACEMENT

- A. In General: ACI 301.
  - 1. Do not disturb reinforcement, inserts, embedded parts, and formed joints.
  - 2. Do not break or interrupt successive pours such that cold joints occur.
  - 3. Honeycomb or embedded debris in concrete is not acceptable.
- B. Hot Weather Placement: ACI 305. If the rate of evaporation approaches 0.2 lb./ft<sup>2</sup>/hr. precautions against plastic shrinkage cracking are necessary. (i.e. dampening Subgrade and forms; placing concrete at the

lowest possible temperature; erecting windbreaks and sunshades; fog sprays; use of evaporation retardants; or rescheduling time of placement).

- C. Cold Weather Placement: ACI 306. Accelerating admixture may be used in concrete work placed at ambient temperatures below 50 deg F. Use of admixtures will not relax cold weather placement, curing, or protection requirements. . If air temperature is forecasted to fall below 32 deg F. within 14 days of placement, proceed as follows:
  - 1. Provide cold weather protection (cover, insulation, heat, etc.).
  - 2. Do not use chemical “anti-freeze” additives in the concrete. (NOTE: this does not apply to normal accelerators.)
  - 3. Do not proceed with the placement of concrete until the temperature of all contact surfaces is 35 degrees F and ambient temperature is ascending.
  - 4. Protect the concrete from freezing until a compressive strength of at least 90 percent of design strength has been achieved, determined by either:
    - a. Maturity meter. Refer to AASHTO T 325, or.
    - b. Field cured cylinders.
  - 5. Adequately vent combustion-type heaters that produce carbon monoxide.
  - 6. When applying external heat, maintain moist conditions to avoid excessive moisture loss from concrete.
  - 7. When removing heat, limit drop in temperature of concrete surfaces to 20 degrees F during any 12 hour period until the surface temperature of the concrete reaches that of the atmosphere.
- D. Concrete Temperature: Keep mixed concrete temperature at time of placement between 60 deg F and 90 deg F
- E. Do not disturb reinforcement, inserts, embedded parts, and formed joints.
- F. Do not break or interrupt successive pours such that cold joints occur.
- G. Honeycomb or embedded debris in concrete is not acceptable.

### 3.5 JOINTS AND JOINT SEALING

- A. Steel edging and jointing tools are acceptable. Preferred are magnesium, aluminum or wood tools
- B. Pavement joint sealing, Section 32 13 73.

### 3.6 CONSOLIDATION

- A. Keep spare vibrator available during concrete placement operations.
- B. Follow ACI 309 requirements.

### 3.7 CURING

- A. Section 03 39 00. Use a membrane forming compound unless specified otherwise.

### 3.8 FINISHING

A. Section 03 35 00 and as follows.

| <b>Table 1 – Finishes</b>  |                            |
|--|----------------------------|
| <b>Type of work</b>  | <b>Finish</b>              |
| Sidewalks, garage floors, ramps, exterior concrete Pavement  | Broom or belt              |
| Exterior platforms, steps, and landings, exterior and interior pedestrian ramps, not covered by other finish materials                             | Non-slip                   |
| Surfaces intended to receive bonded applied cementitious applications  | Scratched                  |
| Surfaces intended to receive roofing, except future floors, waterproofing membranes, and roof surfaces that are future floors or sand bed terrazzo | Floated                    |
| Floors and roof surfaces that are floors intended as walking surfaces or to receive floor coverings  | Troweled                   |
| Unpainted concrete surfaces not exposed to public view   | Rough as-cast form finish  |
| Unpainted concrete surfaces exposed to public view   | Smooth as-cast form finish |
| Concrete surfaces to receive paint or plaster  | Grout cleaned finish       |

### 3.9 PROTECTION AND REPAIR

A. Protection, Section 01 66 00:

1. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, graffiti, and mechanical injury.
2. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

B. Repair:

1. Modify or replace concrete not conforming to required levels, lines, details, and elevations.
2. Structural analysis and additional testing may be required at no additional cost to OWNER when the strength of a structure is considered potentially deficient.
3. To patch imperfections refer to Section 03 35 00 requirements.
4. Remove graffiti and mechanical injury.

END OF SECTION



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## SECTION 03 35 00 CONCRETE FINISHING

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### PART 1 GENERAL

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#### 1.1 SECTION INCLUDES

- A. Finishing interior and exterior concrete surfaces.

#### 1.2 REFERENCES

- A. **ACI Standards:**

303 Guide to Cast-in-Place Architectural Concrete Practice.

#### 1.3 SUBMITTALS

- A. Name, type, chemical analysis and manufacturer's recommended rate of application for liquid chemical hardener.

#### 1.4 PROJECT CONDITIONS

- A. Protect adjacent materials and finishes from dust, dirt and other surface or physical damage during finishing operations. Provide protection as required and remove from site at completion of Work.

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### PART 2 PRODUCTS

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#### 2.1 MATERIALS

- A. Masonry Mortar and Grout: Section 04 05 16.
- B. Dry Shake: Blend of metallic or mineral aggregate with Portland cement concrete in proportions recommended by manufacture.
- C. Proprietary Materials: If permitted or required, proprietary compounds may be used in lieu of or in addition to foregoing blended materials. Use such compounds per manufacturer's recommendations.
- D. Liquid-Chemical Hardener: Colorless, aqueous solution containing a blend of magnesium fluosilicate, zinc fluosilicate and a wetting agent. Mixture contains not less than two (2) pounds fluosilicate per gallon and does not interfere with adhesives and bonding.

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### PART 3 EXECUTION

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#### 3.1 PREPARATION

- A. Examine areas and conditions under which work of this section will be performed.
- B. Correct conditions detrimental to timely and proper finishing.

- C. Do not proceed until unsatisfactory conditions are corrected.

### 3.2 FINISHING HORIZONTAL SLABS

- A. **Do not apply water (i.e. sprinkle) to any surface of concrete when finishing slabs.**
- B. Edges and Joints: Tools may be made out of steel. Preferred is wood, aluminum or magnesium.
- C. Tolerances:
  - 1. Class A: 1 in 1000.
  - 2. Class B: 1 in 500.
  - 3. Class C: 1 in 250.
- D. Float Finish: After concrete has been placed, consolidated, struck-off, and leveled, do not work further until ready for floating:
  - 1. Begin floating when water sheen has disappeared and surface has sufficient stiffness.
  - 2. During or after first floating, check planeness of entire surface with a 10 feet long straightedge applied at two (2) or more different angles.
  - 3. Cut down high spots and fill low spots to the required tolerance.
  - 4. Refloat slab immediately to a uniform sandy texture.
- E. Trowel Finish:
  - 1. Do not use steel trowel or a power trowel on exterior concrete or on concrete that contains more than three (3) percent air.
  - 2. First troweling shall produce smooth surface relatively free of defects but which may still show some trowel marks.
  - 3. Second troweling after surface has stiffened shall make finished surface essentially free of trowel marks, uniform in texture and appearance.
  - 4. On surfaces intended to support floor coverings, grind off defects that would show through floor covering.
- F. Broom or Belt Finish: Sweep surface with brushes, rakes, tines or burlap belt before final set.
- G. "Dry Shake" Finish: Give the surface a floated finish. Evenly apply approximately 2/3 of a blended unsegregated material:
  - 1. Begin floating immediately after application of first "dry shake".
  - 2. After material has been embedded by floating, apply remainder of blended material to surface at right angles to previous application.
  - 3. Make second application heavier in any areas not sufficiently covered by first application.
  - 4. Immediately follow with second floating.
  - 5. After selected material has been embedded by second floating, complete operation with a broomed, floated, or troweled finish, as indicated.

- H. Non-slip Finish: Give surface a "dry shake" application, using crushed ceramically bonded aluminum oxide particles. Apply at 25 pounds per 100 square feet.
- I. Exposed Aggregate Finish: Immediately after surface of concrete has been leveled to tolerance and surface water has dissipated, spread aggregate uniformly over surface to provide complete coverage to the depth of a single stone:
  - 1. Embed aggregate into surface by light tamping.
  - 2. Float surface until embedded aggregate is fully coated with mortar and surface has been brought to tolerance.
  - 3. Start exposure of aggregate after matrix has hardened sufficiently to prevent dislodgment.
  - 4. Flow ample quantities of water, without force, over surface of concrete while matrix encasing aggregate is removed by brushing with a fine bristle brush.
  - 5. Continue until aggregate is uniformly exposed.
  - 6. An approved chemical retarder sprayed onto freshly floated surface may be used to extend working time.
- J. Chemical-Hardener Finish: Apply liquid chemical-hardener finish to interior concrete floors where indicated. Do not apply liquid chemical hardener on floor areas scheduled to receive synthetic matrices terrazzo, setting beds for tile, terrazzo, vinyl flooring, or like items. Apply hardener after complete curing and drying of concrete surface per manufacturer's recommendations. Evenly apply each coat, and allow 24 hours for drying between coats. After final coat of chemical-hardener solution is applied and dried, remove surplus hardener by scrubbing and mopping with water.

### 3.3 FINISHING FORMED SURFACES

- A. General:
  - 1. Allow concrete to cure not more than 72 hours before commencing surface finish operations, unless approved otherwise.
  - 2. Revise the finishes as needed to secure approval.
- B. As-Cast Form Finish:
  - 1. Rough: Patch defects, chip or rub off fins exceeding 1/4 inch height.
  - 2. Smooth: Patch tie holes and defects and remove fins completely:
    - a. When surface texture is impaired and form joints misaligned, grind, bush-hammer, or correct affected concrete.
    - b. Slurry grout areas evidencing minor mortar Leakage to match adjacent concrete.
    - c. Repair major mortar Leakage as a defective area.
    - d. When workmanship is less than acceptable standard, provide one of rubbed finishes at no additional cost to OWNER.

C. Rubbed Finishes:

1. Smooth: Remove forms and perform necessary patching as soon after placement as possible:
  - a. Finish newly hardened concrete no later than 24 hours following form removal.
  - b. Wet surfaces and rub with carborundum brick or other abrasive until uniform color and texture are produced.
2. Grout Cleaned: Undertake no cleaning operations until all contiguous surfaces are completed and accessible:
  - a. Wet surface of concrete sufficiently to prevent absorption of water from grout.
  - b. Apply grout uniformly.
  - c. Immediately after grouting, scrub surface with cork float or stone to coat surface and fill voids.
  - d. While grout is still plastic, remove excess grout by working surface with rubber float or sack.
  - e. After surface whitens from drying, rub vigorously with clean burlap.
  - f. Keep damp for at least 36 hours after final rubbing.
3. Cork Floated: Remove forms within two (2) to three (3) days of placement where possible:
  - a. Remove ties.
  - b. Remove all burrs and fins.
  - c. Dampen wall surface.
  - d. Apply mortar with firm rubber float or with trowel, filling all surface voids.
  - e. Compress mortar into voids.
  - f. If mortar surface dries too rapidly to permit proper compaction and finishing, apply a small amount of water with fog sprayer.
  - g. Produce final texture with cork float using a swirling motion.

D. Unformed Finish:

1. After concrete is placed, strike smooth, tops of walls or buttresses, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces.
2. Float to texture that is reasonably consistent with formed surfaces.
3. Continue final treatment on formed surfaces uniformly across unformed surfaces.

E. Blasted Finish:

1. Perform abrasive blasting within 24 to 72 hours after casting.
2. Coordinate with form work construction, concrete placement schedule, and formwork removal to ensure that surfaces are blasted at the same age for uniform results.

3. Reapply curing protection after blast finishing
- F. Architectural Finish, ACI 303:
  1. Tooled Finish:
    - a. Dress thoroughly cured concrete surface with electric, air, or hand tools to uniform texture, and give a bush hammered surface texture.
    - b. Remove sufficient mortar to exposed coarse aggregate in relief and to fracture coarse aggregate for tooled finish.
- G. Patched Finish:
  1. Repair defective areas:
    - a. Remove honeycomb and defective concrete to sound concrete.
    - b. Make edges perpendicular to surface or slightly undercut.
    - c. Feather edges are not permitted.
    - d. Dampen area to be patched and at least six (6) inches surrounding it to prevent absorption of patching mortar water.
    - e. Prepare bonding grout.
    - f. Mix to consistency of thick cream.
    - g. Brush into surface.
  2. Tie Holes: Unless indicated otherwise, after being cleaned and thoroughly dampened, fill tie hole solid with patching mortar.
  3. Make patches in concrete closely match color and texture of surrounding surfaces. Determine mix formula for patching mortar by trial and obtain a good color match with concrete when both patch and concrete are cured and dry:
    - a. Mix white and gray Portland cement as required to match surrounding concrete to produce grout having consistency of thick paint.
    - b. Use a minimum amount of mixing water.
    - c. Mix patching mortar in advance and allow to stand without frequent manipulation, without addition of water, until it has reached stiffest placeable consistency.
    - d. After initial set, dress surfaces of patches manually to obtain same texture as surrounding surfaces.
  4. After surface water has evaporated from patch area, brush bond coat into surface:
    - a. When bond coat begins to lose water sheen, apply patching mortar.
    - b. Thoroughly consolidate mortar into place and strike-off to leave patch slightly higher than surrounding surface.

- c. Leave undisturbed for at least one (1) hour before final finish.
  - d. Keep patched area damp for 72 hours or apply curing compound.
  - e. Do not use metal tools in finishing an exposed patch.
5. Where as-cast finishes are indicated, total patched area may not exceed 1 in 500 of as-cast surface. This is in addition to form tie patches, if ties are permitted to fall within as-cast areas.
6. In any finishing process which is intended to expose aggregate on surface, patched areas must show aggregate:
- a. Outer 1 inch of patch shall contain same aggregate as surrounding concrete.
  - b. For aggregate transfer finish, patching mixture shall contain same selected colored aggregates.
  - c. After curing, expose aggregates together with aggregates of adjoining surfaces by same process.

END OF SECTION

## SECTION 03 39 00 CONCRETE CURING

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### PART 1 GENERAL

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#### 1.1. SECTION INCLUDES

- A. Concrete curing requirements.

#### 1.2 REFERENCES

##### A. ACI Standards:

- 301 Structural Concrete for Buildings.
- 305 Hot Weather Concreting.
- 306 Cold Weather Concreting.

##### B. ASTM Standards:

- C171 Sheet Materials for Curing Concrete.
- C1315 Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.

#### 1.3 SUBMITTALS

- A. Curing agent data sheet.
- B. Curing plan. Describe estimated cure quantity and procedure.
- C. Manufacturer certificates, Section 01 33 00 that shows product meets performance criteria.
- D. Manufacturer's recommended installation procedures which, when accepted by ENGINEER, will become the basis for accepting or rejecting installed product.

#### 1.4 QUALITY ASSURANCE

- A. Use workers knowledgeable of ACI 301, 305, 306.

#### 1.5 PRODUCT HANDLING

- A. Protect materials of this Section before, during, and after installation.
- B. Protect the work and materials of other trades.
- C. In the event of damage, immediately make replacements and repair at no additional cost to OWNER.

#### 1.6 WEATHER LIMITATIONS

- A. Above 75 deg F, ACI 305
- B. Below 55 deg F, ACI 306.

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## **PART 2 PRODUCTS**

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### **2.1 COVERS**

- A. Water or Fog-spray: Clean, non-staining and non-detrimental to concrete.
- B. Sheet Coverings: White waterproof paper, polyethylene film, or polyethylene coated burlap sheet complying with ASTM C171.
- C. Mat Coverings: Clean roll goods of cotton or burlap fabric.
- D. Insulating Coverings: Non-staining curing blankets.

### **2.2 MEMBRANE FORMING COMPOUND**

- A. Material:
  - 1. Styrene-acrylic.
  - 2. Styrene-butadiene.
  - 3. Alpha-methylstyrene.
- B. Reference: ASTM C1315:
  - 1. Type II Class A or B (white pigmented).
  - 2. Type ID Class A (clear with fugitive dye).
- C. Volatile Organic Compounds (VOC): Comply with local, state and federal requirements.

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## **PART 3 EXECUTION**

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### **3.1 PREPARATION**

- A. *DO NOT DILUTE CURING COMPOUNDS.*
- B. Do not use membrane forming curing compound on surfaces that are to receive hardeners.
- C. Commence curing operation within 20 minutes after finishing.

### **3.2 APPLICATION – COVERS**

- A. Water: Apply water-fog spray or ponding.
- B. Absorptive Mat: Place absorptive mat to provide coverage of concrete surfaces and edges. Lap over adjacent absorptive covers. Thoroughly saturate with water and keep continuously wet.
- C. Moisture-Retaining Sheet: Place cover in widest practicable width with sides and ends lapped and sealed to prevent moisture loss. Repair any holes or tears during curing period.
- D. Formed Surface Curing: Cure formed concrete surfaces, including underside of beams, supported slabs and other similar surfaces by moist curing with forms in place for full curing period. If forms are removed before curing completion, applying cure film or penetrant or use methods indicated above, as applicable.



**3.3 APPLICATION – MEMBRANE FORMING COMPOUND**

- A. Apply coating continuously and uniformly. Follow manufacturer's recommendations.
- B. Protect continuity of film coatings and repair damage during cure period.
- C. If forms are removed before expiration of cure period, apply coating to unprotected areas.

**3.4 CONCRETE CURE TEMPERATURE**

- A. During cure period, eliminate thermal shock of concrete by keeping cure temperature even throughout extent and depth of concrete.

**3.5 SCHEDULE**

- A. Concrete Exposed to Potable Water (as in Water Storage reservoirs):
  - 1. Moisture cover curing, or
  - 2. Acrylic cure, or
  - 3. Styrene acrylic silane co-polymer cure.

END OF SECTION



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**SECTION 03 40 00**  
**PRECAST CONCRETE**

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**PART 1 GENERAL**

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**1.1 SECTION INCLUDES**

- A. Pre-cast concrete, complete with required connecting and supporting devices.

**1.2 REFERENCES**

**A. ACI Standards:**

- 318 Building Code Requirements for Reinforced Concrete.  
This reference standard includes ASTM material standards.

**B. ASTM Standards:**

- A36: Structural Steel.
- C478 Precast Reinforced Concrete Manhole Sections.
- C857 Minimum Structural Design Loading for Underground Precast Concrete Utility Structures.
- C858 Underground Precast Concrete Utility Structures.
- C891 Installation of Underground Precast Concrete Utility Structures.

**C. AWS Standards:**

- D1.1 Structural Welding Code Steel.
- D1.4 Structural Welding Code Reinforcing Steel.

**D. PCI Standards:**

- Design Handbook.
- MNL-116 Quality Control and Assurance for Plant Production of Prestressed Concrete.
- MNL-117 Quality Control and Assurance for Plant Production of Architectural Precast Concrete.

**1.3 DESIGN CRITERIA**

- A. Design structural precast concrete units, ACI 318 and PCI design handbook.
- B. Design utility precast units, ASTM C857 and C858.
- C. Under direct supervision of a design professional who is fully experienced in design of units.
- D. Design units to support required stripping and handling loads, and live, dead and construction loads.
- E. Design component connections to provide adjustment to accommodate misalignment of structure during installation.

#### 1.4 SHOP DRAWINGS

- A. Prepare Shop Drawings under seal of a licensed design professional.
- B. Submit Shop Drawings, Section 01 33 00.
- C. Indicate unit locations, unit identification marks, fabrication details, reinforcement, connection details, pertinent dimensions, and erection support points. Unit identification marks to appear on all manufactured units.
- D. Do not proceed with fabrication until Shop Drawings have been accepted.

#### 1.5 QUALITY ASSURANCE

- A. Manufacturer:
  - 1. Prestressed: PCI certified.
  - 2. Precast Concrete Units: PCI or NPCA certified
  - 3. Precast Utility Structures and Pipe: ACPA certified.
- B. Transporter: Acceptable to manufacturer.
- C. Erector:
  - 1. Prestressed: PCI certified.
  - 2. Precast: Has five (5) years minimum experience in erecting precast units.
- D. Welders: Certified, AWS D1.1 and AWS D1.4.

#### 1.6 DELIVERY, STORAGE AND HANDLING

- A. Handle precast units in positions consistent with their shape and design. Lift and support only from support points indicated on Shop Drawings.
- B. Embedded Lifting or Handling Devices: Capable of supporting units in positions anticipated during manufacture, storage, transportation, and erection.
- C. Block and laterally brace units while stored at manufacturers. Provide lateral bracing that is sufficient to prevent bowing and warping that is clean, nonstaining, and will not inhibit uniform curing of exposed surfaces.
- D. Provide edges of units with adequate protection to prevent staining, chipping, or spalling of concrete.
- E. Unless otherwise approved in writing, do not deliver units to job site until required for installation.

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## PART 2 PRODUCTS

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#### 2.1 CONCRETE

- A. Above Ground: 5000 psi minimum, Section 03 30 04 and ACI 318.
- B. Underground: Class 4000 minimum, Section 03 30 04 and ASTM C478 or ASTM C858.

## 2.2 ACCESSORIES

- A. Connecting and Supporting Devices: Steel, ASTM A36.
- B. Bolts, Nuts, and Washers: High-strength steel. Section 05 05 23.
- C. Reinforcement: Grade 60 billet steel bars, Section 03 20 00 plain finish

## 2.3 FABRICATION

- A. Maintain plant records and quality control program during production of structural precast concrete. Make records available to ENGINEER.
- B. Use molds which are rigid and constructed of material that will result in uniform finished products.
- C. If self consolidating concrete is NOT used, vibrate concrete to ensure proper consolidation, elimination of unintentional cold joints, and minimize entrapped air on surface.
- D. Fabricate required connecting devices, plates, angles, items fit to steel framing members, bolts and accessories.
- E. Ensure reinforcing steel, anchors, inserts, plates, angles, and other cast-in items are sufficiently embedded, anchored and properly located.
- F. Ensure finished surfaces of precast structural units are uniform.
- G. Cure units under identical conditions to develop specified concrete quality, and minimize appearance blemishes such as non-uniformity, staining or surface cracking.

## 2.4 DESIGN DEVIATIONS

- A. Deviation: Provide installation equivalent to basic intent without additional cost to OWNER. Deviations from exact required cross-section will be permitted only with approval.
- B. Manufacturer's Proposed Design: Supported by complete design calculations and drawings. When requested, submit design calculations for review bearing seal and signature of a licensed design professional.

## 2.5 OPENINGS

- A. Provide required openings, six (6) inches or larger. If approved, smaller sizes may be field constructed by coring or sawing.

## 2.6 FINISHES

- A. General: Required finish will be described in one of the following paragraphs. If no finish is indicated or selected by ENGINEER, provide Standard Finish.
- B. Standard Finish: Produced in forms such as plastic or metal lined that impart a smooth finish to the concrete. Small surface holes, normal form joint marks, minor chips and spall are acceptable if approved. Major or unsightly imperfections, honeycomb or structural defects are not acceptable.
- C. Commercial Finish: Produced in forms such as plywood or lumber that impart texture to concrete. Remove fins and large projections. Fill holes over 3/8 inch. Make faces true and well defined. Correct exposed ragged edges by rubbing or grinding.

- D. Architectural Grade A Finish: Produced in forms such as plastic or metal lined that impart smooth finish to concrete. Fill holes over 1/4 inch in diameter with sand-cement paste. Grind smooth form offsets or fins over 1/8 inch. Coat with neat cement paste using float. After paste coat has dried, rub with burlap to remove loose particles.
- E. Architectural Grade B Finish: Produced in forms such as plastic or metal lined that impart smooth finish to concrete. Fill holes over 1/4 inch in diameter with sand-cement paste. Grind smooth form offsets or fins over 1/8 inch.
- F. Special Finishes: Sandblasting, acid washing, retarders or form liners as approved by ENGINEER. Special finishes require submittal of two 12 x 12 inch Samples showing a representative color and texture to be used.
- G. Painted Finishes: On concrete to be painted, use a form release agent acceptable to the paint manufacturer.

## **2.7 REPAIR**

- A. Repair of damaged units is acceptable if structural integrity or appearance is not impaired.

## **2.8 ALLOWABLE TOLERANCES**

- A. Length: Plus or minus 3/4 inch, or plus or minus 1/8 inch per 10 feet of length, whichever is greater, or as indicated.
- B. End Squareness: 1/2 inch maximum.
- C. Blockouts: 1 inch of centerline location indicated.

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# **PART 3 EXECUTION**

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## **3.1 INSTALLATION**

- A. Do not install precast units until concrete has attained its design compressive strength.
- B. Install members plumb, level, and in alignment within PCI MNL-116 or PCI MNL-117 and indicated limits of erection tolerances.
- C. Clean weld marks or other marks, debris, or dirt from exposed surfaces of units.
- D. Install underground utility precast units per ASTM C891.

## **3.2 PERFORMANCE REQUIREMENTS**

- A. Conduct inspections, perform testing, and make repairs or replace unsatisfactory precast units as required.

- B. Rejection: Units may be rejected for any one of the following:
1. Exceeding specified installation tolerances.
  2. Damaged during construction operations.
  3. Exposed-to-view surfaces which develops surface deficiencies.
  4. Other defects as listed in PCI MNL-116 or PCI MNL-117.

END OF SECTION

**SECTION 03 61 00**  
**CEMENTITIOUS GROUTING**

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**PART 1 GENERAL**

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**1.1 SECTION INCLUDES**

- A. Pre-mixed non-metallic shrinkage resistant grout, pre-mixed water stop hydraulic cement grout, epoxy grout, and Portland cement grout:
  - 1. Grout for leveling beds of structural steel plates.
  - 2. Sealing of joints and gaps between piping and structures.
  - 3. Sealing of joints between construction components.

**1.2 REFERENCES****A. ASTM Standards:**

- C109 Compressive Strength of Hydraulic Cement Mortars (Using 2 in. or 50 mm Cube Specimens).
- C144 Aggregate for Masonry Mortar.
- C150 Portland Cement.
- C190 Tensile Strength of Hydraulic Cement Mortars.
- C207 Hydrated Lime for Masonry Purposes.
- C472 Physical Testing of Gypsum Plasters and Gypsum Concrete.
- C595 Blended Hydraulic Cements.
- C881 Epoxy - Resin - Base Bonding Systems for Concrete.
- C1090 Measuring Changes in Height of Cylindrical Specimens from Hydraulic-Cement Grout.
- C1107 Packaged Dry Hydraulic Cement (Non-Shrink).
- C1157 Blended Hydraulic Cement.
- D570 Water Absorption of Plastics.
- D638 Tensile Properties of Plastics.
- D695 Compressive Properties of Rigid Plastics.

**1.3 SUBMITTALS**

- A. Grout mix components. Indicate proportions used, environmental conditions, and admixture limitations. Indicate material "Type", "Grade", and "Class" which suits Project requirements.
- B. Manufacturer's data for latex bonding agent.



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## **PART 2 PRODUCTS**

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### **2.1 MATERIALS - GENERAL**

- A. Cement:
  - 1. Portland: Natural color Type II (normal) or Type IIA (air entrained), ASTM C150.
  - 2. Blended: ASTM C595 or C1157.
- B. Lime: Type S, hydrated, ASTM C207.
- C. Water: Clean, non-staining, non-detrimental.
- D. Aggregate: Standard masonry type, ASTM C144.

### **2.2 PORTLAND CEMENT GROUT**

- A. Proportions by Volume: One part Portland cement, and sand equal to 2-1/2 to three times sum of volumes of cement and lime.
- B. Mix thoroughly with water to form a stiff workable plastic putty.
- C. Compressive Strength: 2800 psi in 28 days, ASTM C109.

### **2.3 GYPSUM PLASTER GROUT**

- A. Premixed, prepackaged, wood fiber gypsum plaster with an ASTM C472 minimum average dry compressive strength of 2000 psi in 28 days.
- B. Mix with water per manufacturer's instructions for intended use to form a stiff plastic mix required for workability.

### **2.4 CEMENT BASED SHRINKAGE RESISTANT GROUT**

- A. Grade B or Grade C: ASTM C1107. Premixed, non-metallic, non-gaseous product at a fluid consistency (flow cone) of 20 to 30 seconds. Thirty-minute-old grout shall flow through flow cone after slight agitation, in temperatures of 40 deg F to 90 deg F
- B. Bleeding: None.
- C. Compressive Strength: 6500 to 9000 psi in 28 days, ASTM C109.
- D. Non-shrink percentage: 0.5 percent, ASTM C1090.

### **2.5 EPOXY ADHESIVE GROUT**

- A. Two component material, ASTM C881. Suitable for use on dry or damp surfaces, 100 percent solids, high modulus, moisture insensitive:
  - 1. Tensile Strength: 5000 psi minimum in 14 days, ASTM D638.
  - 2. Tensile Elongation: Two (2) percent minimum, ASTM D638.
  - 3. Compressive Strength: 6500 psi minimum in 24 hours and 70 deg F, 12,500 psi in 28 days and 70 deg F, ASTM D695.
  - 4. Water Absorption: One percent maximum, ASTM D570.
  - 5. Bond Strength:

- a. Direct Shear: 400 psi.
  - b. Direct Tension: 250 psi.
  - c. Beam Break: 800 psi.
6. Pot Life: Five minutes maximum at 70 deg F

## **2.6 BONDING GROUT**

- A. Of approximately one part cement to one part fine sand passing a No. 30 sieve with approved latex bonding agent when allowed.

## **2.7 PNEUMATICALLY PLACED PLASTER ("GUNITE" OR "SHOTCRETE")**

- A. Materials: Portland cement, lime, water and sand.
- B. Compressive Strength: 2800 psi in 28 days, ASTM C109.
- C. Proportioning: One part cement to not more than five parts sand.

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# **PART 3 EXECUTION**

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## **3.1 INSTALLATION**

- A. Fill joints, voids, and pockets, completely.
- B. Comply with manufacturer's instructions and UBC Chapter 47.
- C. Finish surfaces exposed to view smooth.
- D. Pneumatically Placed Plaster: Screened and reused rebound material in an amount not greater than 25 percent of the total sand in any batch.

END OF SECTION

## ***Corner curb cut assembly***

### **1. GENERAL**

- A. Where existing elements or spaces are altered to receive an assembly; slopes and dimensions shall comply with slopes and dimensions shown on the drawing, or to the maximum extent feasible permitted by the ENGINEER. Final configuration of the assembly may be different than shown. Where physical constraints (e.g. utility covers, poles, vaults, etc.) prevent compliance, a single diagonal curb cut assembly may serve both pedestrian street crossings.
- B. Installation of flares or curb returns is ENGINEER's choice.
- C. Definitions and supplemental requirements are specified in APWA Section 32 16 14.

### **2. PRODUCTS**

- A. Base Course: Untreated base course, APWA Section 32 11 23. Do not use gravel as a base course without ENGINEER's permission.
- B. Expansion Joint Filler: 1/2-inch thick type F1 full depth, APWA Section 32 13 73.
- C. Detectable Warning Surface: Paver, ribbed composite panel, or tile. Provide a color that contrasts with adjacent walking surface, either light-on-dark or dark-on-light. ENGINEER to select type and color unless indicated elsewhere.
- D. Concrete: Class 4000, APWA Section 03 30 04.
- E. Concrete Curing Agent: Clear membrane forming compound with fugitive dye (Type ID Class A), APWA Section 03 39 00.

### **3. EXECUTION**

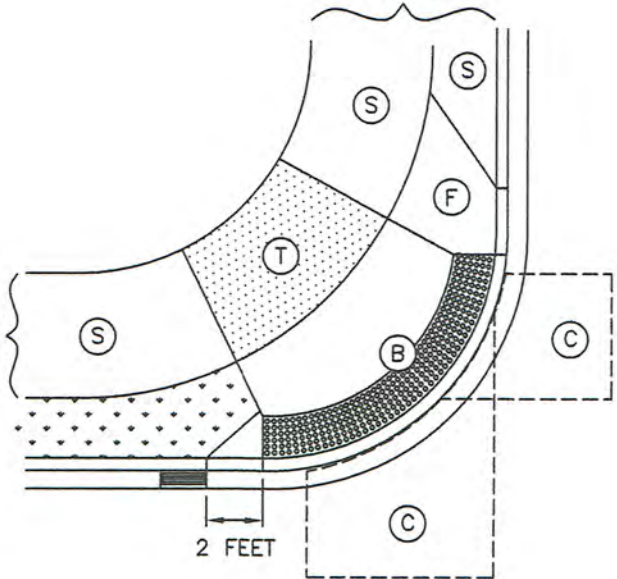
- A. Base Course Placement: APWA Section 32 05 10. Maximum lift thickness before compaction is 8-inches when using riding equipment or 6-inches when using hand held equipment. Compaction is 95 percent or greater relative to a modified proctor density, APWA Section 31 23 26.
- B. Curb Modifications:
  - 1) The sloped surface created to accommodate a flare area shall be perpendicular to the back of curb.
  - 2) No grade break shall exist between the flow-line and the foot of the curb ramp or blended transition. Length of the curb modification abutting the curb ramp or transition is 4 feet minimum for each crosswalk served.
- C. Curb Ramp: Length not required to exceed 15 feet. Grade breaks are perpendicular to the direction of ramp run and are not permitted on ramp or turning space surface. Sides are parallel to each other and perpendicular to the ends. At the bottom grade break it may be necessary to install a transition zone, (APWA Plan 238).
- D. Concrete Placement: APWA Section 03 30 10.
  - 1) Maximum length to width ratio for rectangular panel joints is 1.5 to 1. Joint spacing measured in feet not to exceed twice slab thickness measured in inches or a maximum of 15 feet.
  - 2) Install expansion joints vertical, full depth, with top of filler set flush with concrete surface. Install contraction joints vertical, 1/8-inch wide, and 1/4 of the depth of the concrete flatwork.
  - 3) Provide 1/2-inch radius edges. Apply a broom finish. Apply a curing agent.
- E. Clear Space: No trip hazards in the clear space.

# TURNING SPACE AT SIDEWALK LEVEL

THE LOCATION OF THE PEDESTRIAN ACCESS ROUTE AFFECTS FLARE SLOPE CONSTRUCTION.

PEDESTRIAN ACCESS ROUTE

PEDESTRIAN ACCESS ROUTE

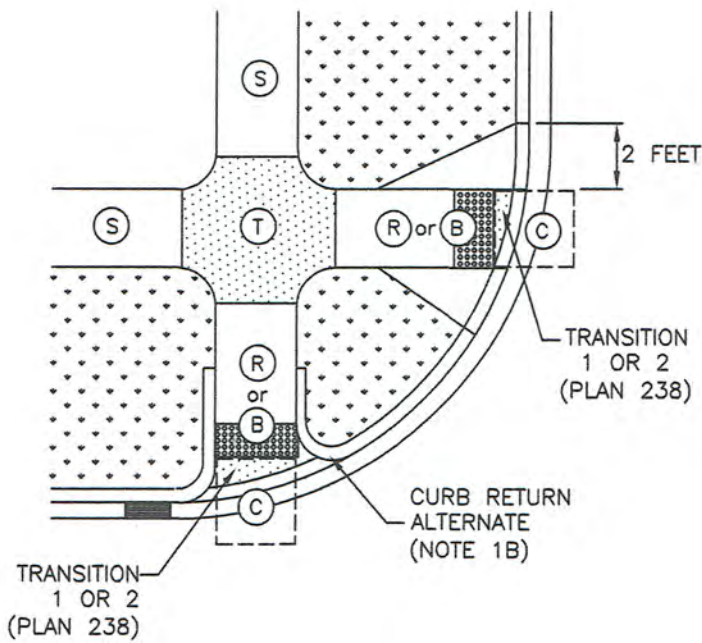


**EXAMPLE A**

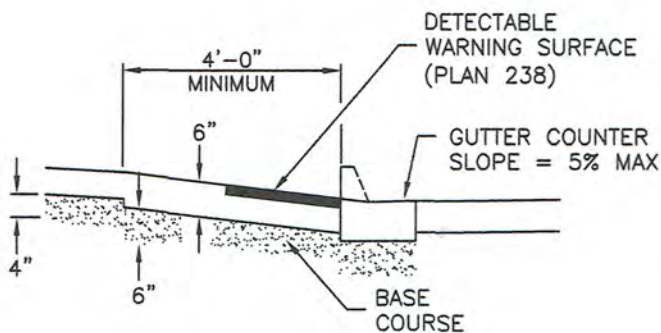
| ELEMENT | DIMENSION             |
|---------|-----------------------|
| (R) (B) | 4 FEET WIDE MINIMUM   |
| (C) (T) | 4 FEET SQUARE MINIMUM |

WHERE TURNING SPACE IS CONSTRAINED ON 2 SIDES, PROVIDE 5 FEET IN THE DIRECTION OF THE CROSSWALK

**TABLE OF DIMENSIONS**



**EXAMPLE B**



**MATERIALS**

|                        | RUNNING SLOPE (%) MAXIMUM | CROSS SLOPE (%) MAXIMUM |
|------------------------|---------------------------|-------------------------|
| TURNING SPACE (T)      | 2                         | 2                       |
| CURB RAMP (R)          | 8.33                      | 2 (c)                   |
| BLENDED TRANSITION (B) | 5                         | 2 (c)                   |
| CLEAR SPACE (C)        | 5                         | 2 (c)                   |
| SIDEWALK (S)           | STREET GRADE              | 2                       |
| FLARE (F)              | 10                        | --                      |

- (a) RUNNING SLOPE IS IN THE DIRECTION OF PEDESTRIAN TRAVEL. RUNNING SLOPE OF FLARE IS PARALLEL TO BACK OF CURB
- (b) CROSS SLOPE IS PERPENDICULAR TO DIRECTION OF PEDESTRIAN TRAVEL
- (c) SLOPE MAY EQUAL STREET OR HIGHWAY GRADE AT CROSSWALKS THAT ARE WITHOUT VEHICULAR YIELD OR STOP CONTROL

**SLOPE TABLE**

## ***Curb and gutter***

### **1. GENERAL**

- A. Variance from specified dimensions and slopes must be acceptable to the ENGINEER. System configuration may be changed at ENGINEER's discretion.
- B. Additional requirements are specified in APWA Section 32 16 13.

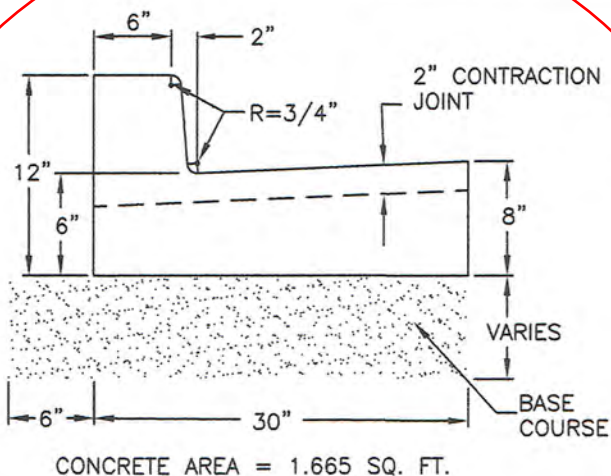
### **2. PRODUCTS**

- A. Base Course: Untreated base course, APWA Section 32 11 23. Do not use gravel as a base course without ENGINEER's permission.
- B. Expansion Joint Filler: 1/2-inch thick type F1 full depth, APWA Section 32 13 73.
- C. Concrete: Class 4000, APWA Section 03 30 04. If necessary, provide concrete that achieves design strength in less than 7 days. Use caution; however, as concrete crazing (spider cracks) may develop if air temperature exceeds 90 degrees F.
- D. Concrete Curing Agent: Clear membrane forming compound with fugitive dye (Type ID Class A), APWA Section 03 39 00.

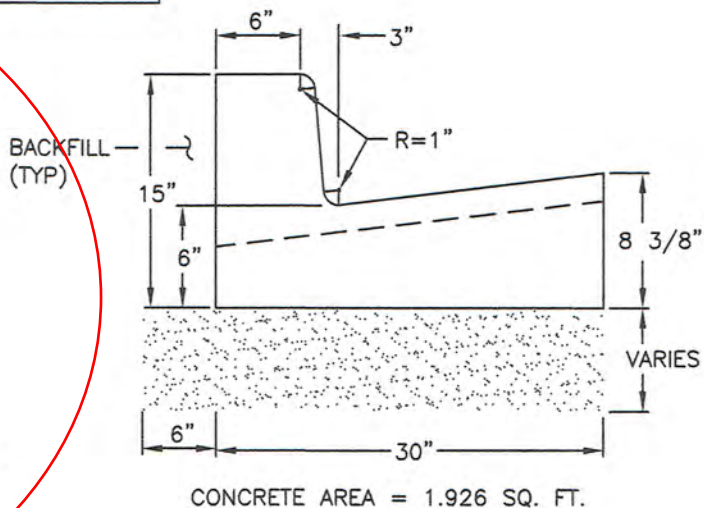
### **3. EXECUTION**

- A. Base Course Placement: APWA Section 32 05 10. Thickness is 6-inches if flow-line grade is 0.5 percent ( $s=0.005$ ) or greater. If slope is less, provide 8-inches. Maximum lift thickness before compaction is 8-inches when using riding equipment or 6-inches when using hand held equipment. Compaction is 95 percent or greater relative to a modified proctor density, APWA Section 31 23 26.
- B. Concrete Placement: APWA Section 03 30 10.
  - 1) Install expansion joints vertical, full depth, with top of filler set flush with concrete surface. Install at the start or end of a street intersection curb return. Expansion joints are not required in concrete placement using slip-form construction.
  - 2) Install contraction joints vertical, 1/8-inch wide or 1/4 slab thickness if the slab is greater than 8-inches thick. Match joint location in adjacent Portland-cement concrete roadway pavement.
  - 3) Provide 1/2-inch radius edges. Apply a broom finish. Apply a curing agent.
- C. Protection and Repair: Protect concrete from deicing chemicals during cure. Repair construction that does not drain. If necessary, fill flow-line with water to verify.

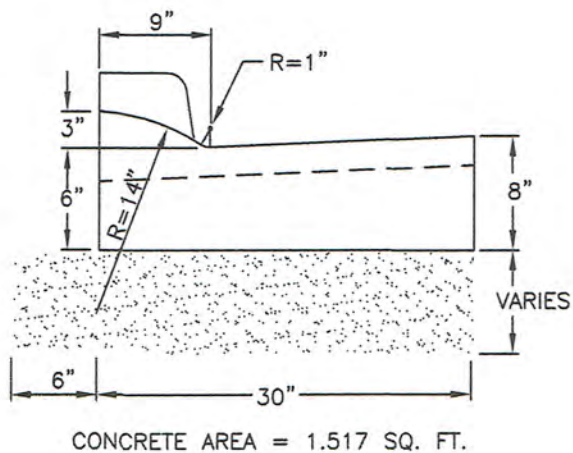
BACKFILL BEHIND CURB BEFORE  
PAVING AGAINST LIP OF GUTTER



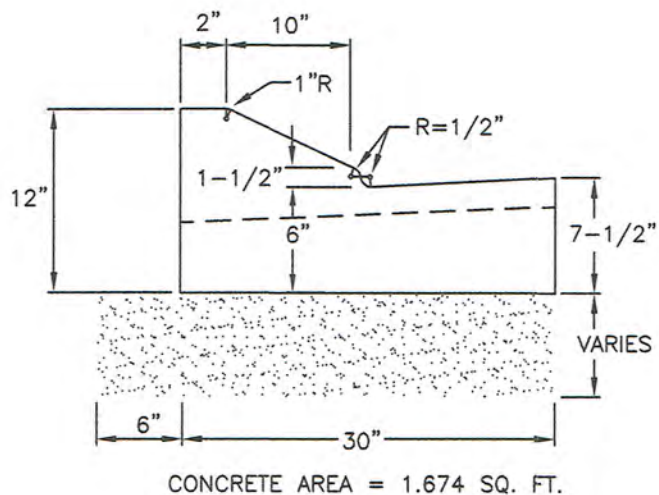
**Type A**



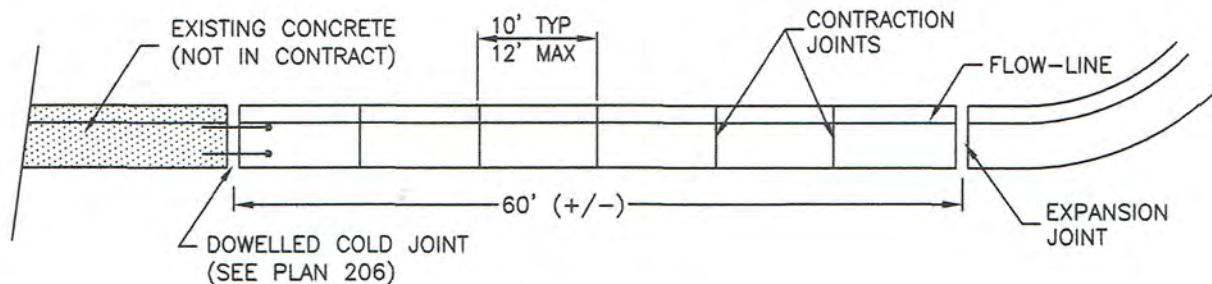
**Type B**



**Type C**



**Type D**



**JOINT DETAIL**



## ***Curb and gutter connection***

### **1. GENERAL**

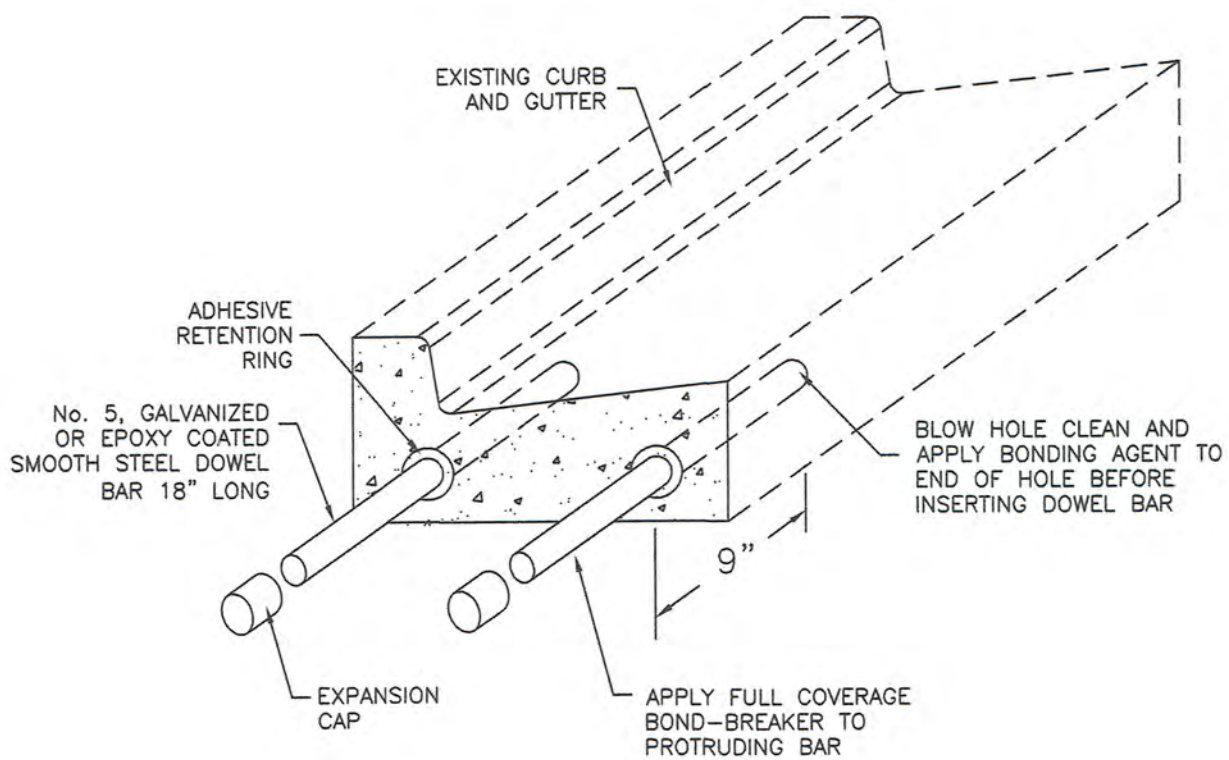
- A. Connect new curb and gutter to existing curb and gutter that has not been placed by CONTRACTOR.

### **2. PRODUCTS**

- A. Reinforcement: Galvanized or epoxy coated, 60 ksi yield grade steel, ASTM A615.
- B. Adhesive: Epoxy adhesive grout, APWA Section 03 61 00.
- C. Bond Breaker: Paraffin wax, lithium grease, or other semi-solid, inert lubricant.
- D. Expansion Cap: Plastic, with bar movement allowance of 1/2-inch.

### **3. EXECUTION**

- A. Ensure drill rigs (or jigs) are set at mid-depth of the gutter and horizontal to the surface. Make hole size large enough to account for dowel bar and adhesive.
- B. Clean holes and dowel bars of dirt, dust and particles. Ensure coating on bars have no surface defects.
- C. Place bonding agent in the back of each hole so adhesive flows out around each bar fully encasing it. DO NOT apply adhesive to end of the bar and then insert the bar into the hole.
- D. Insert dowels with at least one full turning motion and if necessary, place a grout retention disk on the dowel after insertion to contain adhesive.
- E. Apply complete coverage of bond-breaker on the protruding end of each dowel.
- F. Install expansion caps on protruding dowel bar ends.





## **Waterway**

### **1. GENERAL**

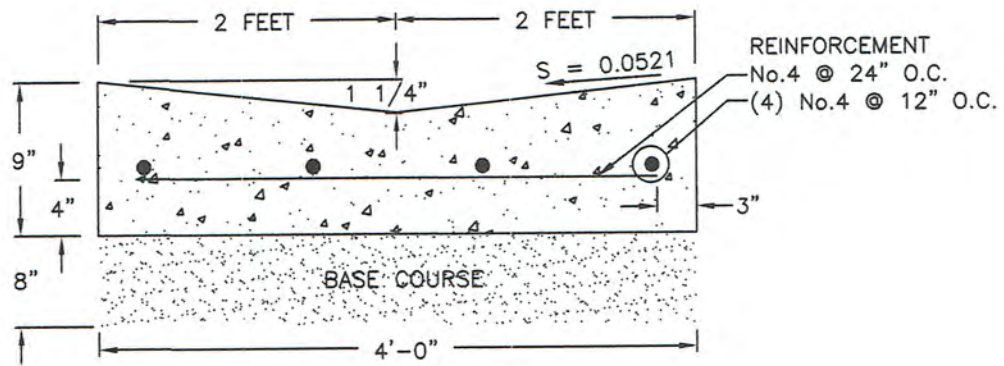
- A. Variance from specified dimensions and slopes must be acceptable to the ENGINEER. System configuration may be changed at ENGINEER's discretion.
- B. Unless indicated otherwise, width of waterway as follows.
  - 1) 4 feet for a residential street.
  - 2) 6 feet for a non-residential street.
  - 3) If wider than 6 feet, offset the flow line in the waterway to match (line up with) the curb and gutter flow line. Adjust cross slopes to match existing slopes.
- C. Additional requirements are specified in APWA Section 32 16 13.

### **2. PRODUCTS**

- A. Base Course: Untreated base course, APWA Section 32 11 23. Do not use gravel as a base course without ENGINEER's permission.
- B. Expansion Joint Filler: 1/2-inch thick type F1 full depth, APWA Section 32 13 73.
- C. Concrete: Class 4000, APWA Section 03 30 04. If necessary, provide concrete that achieves design strength in less than 7 days. Use caution; however, as concrete crazing (spider cracks) may develop if air temperature exceeds 90 degrees F.
- D. Reinforcement: Galvanized or epoxy coated, deformed, 60 ksi yield grade steel, ASTM A615.
- E. Concrete Curing Agent: Clear membrane forming compound with fugitive dye (Type ID Class A), APWA Section 03 39 00.

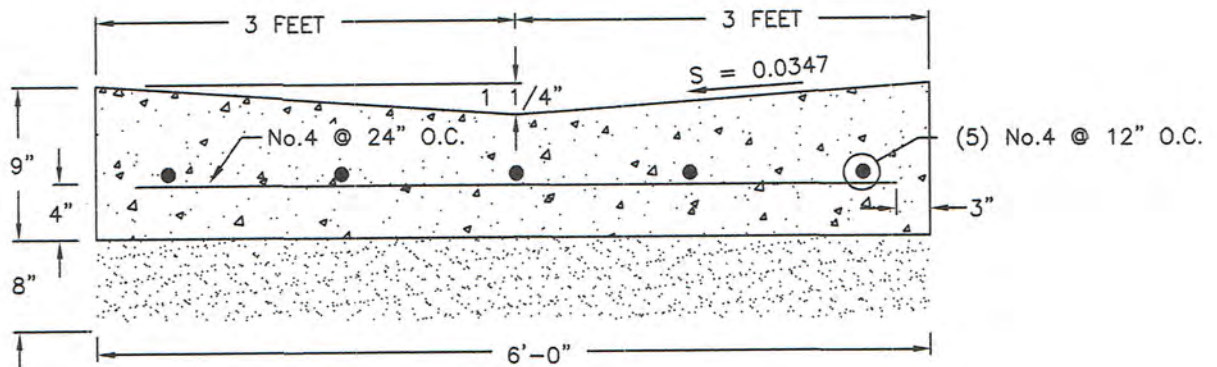
### **3. EXECUTION**

- A. Base Course Placement: APWA Section 32 05 10. Thickness is 6-inches if flow-line grade is 0.5 percent ( $s=0.005$ ) or greater. If slope is less, provide 8-inches. Maximum lift thickness before compaction is 8-inches when using riding equipment or 6-inches when using hand held equipment. Compaction is 95 percent or greater relative to a modified proctor density, APWA Section 31 23 26.
- B. Concrete Placement: APWA Section 03 30 10.
  - 1) Install expansion joints vertical, full depth, with top of filler set flush with concrete surface. Expansion joints are not required in concrete placement using slip-form construction.
  - 2) Install contraction joints vertical, 1/8-inch wide or 1/4 slab thickness if the slab is greater than 8-inches thick. Match joint location in adjacent Portland-cement concrete roadway pavement.
  - 3) Provide 1/2-inch radius edges. Apply a broom finish. Apply a curing agent.
- C. Protection and Repair: Protect concrete from deicing chemicals during cure. Repair construction that does not drain. If necessary, fill flow-line with water to verify.



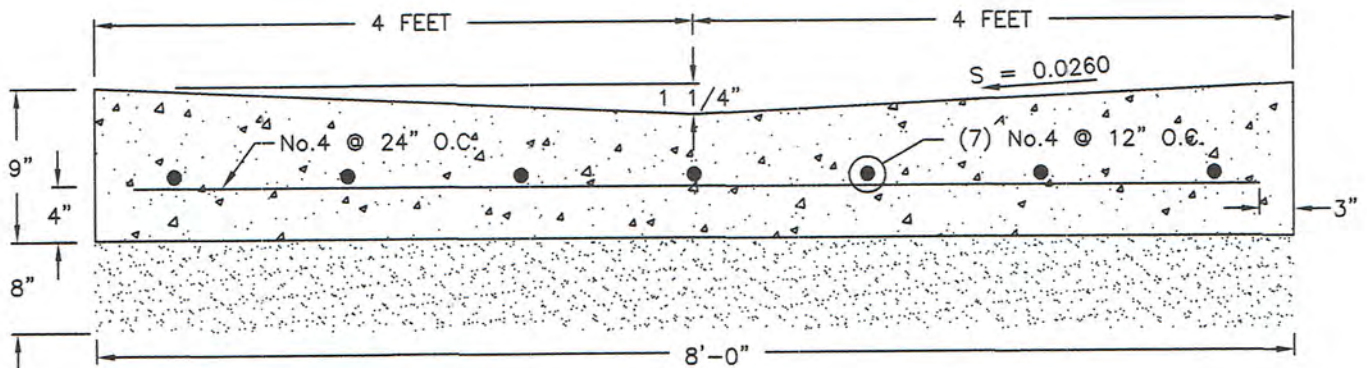
### 4'-0" WATERWAY

CONCRETE AREA = 2.583 SQ. FT.



### 6'-0" WATERWAY

CONCRETE AREA = 3.875 SQ. FT.



### 8'-0" WATERWAY

CONCRETE AREA = 5.166 SQ. FT.

## ***Waterway transition structure***

### **1. GENERAL**

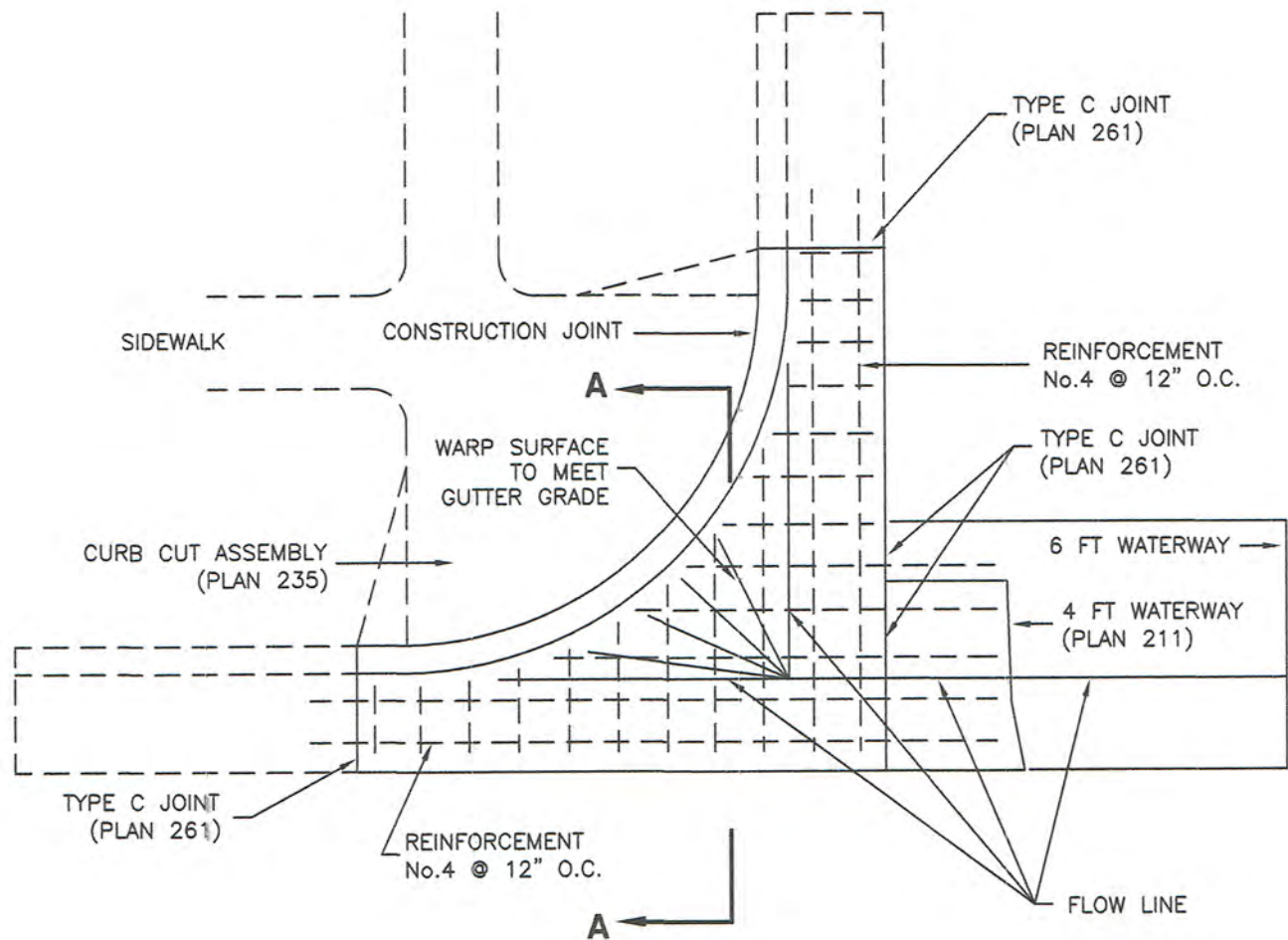
- A. Variance from specified dimensions and slopes must be acceptable to the ENGINEER. System configuration may be changed at ENGINEER's discretion.
- B. Additional requirements are specified in APWA Section 32 16 13..

### **2. PRODUCTS**

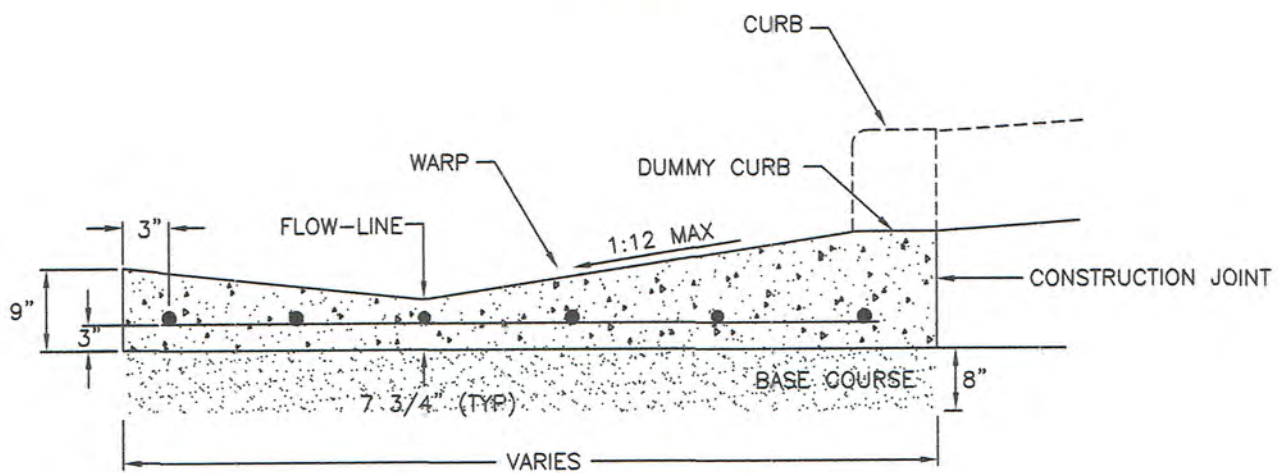
- A. Base Course: Untreated base course, APWA Section 32 11 23. Do not use gravel as a base course without ENGINEER's permission.
- B. Expansion Joint Filler: 1/2-inch thick type F1 full depth, APWA Section 32 13 73..
- C. Concrete. Class 4000, APWA Section 03 30 04. If necessary, provide concrete that achieves design strength in less than 7 days. Use caution; however, as concrete crazing (spider cracks) may develop if air temperature exceeds 90 degrees F.
- D. Reinforcement. Galvanized or epoxy coated, deformed, 60 ksi yield grade steel, ASTM A615.
- E. Concrete Curing Agent: Clear membrane forming compound with fugitive dye (Type ID Class A), APWA Section 03 39 00.

### **3. EXECUTION**

- A. Base Course Placement: APWA Section 32 05 10. Maximum lift thickness before compaction is 8-inches when using riding equipment or 6-inches when using hand held equipment. Compaction is 95 percent or greater relative to a modified proctor density, APWA Section 31 23 26.
- B. Concrete Placement: APWA Section 03 30 10.
  - 1) Install expansion joints vertical, full depth, with top of filler set flush with concrete surface. Install at the start or end of a street intersection curb return. Expansion joints are not required in concrete placement using slip-form construction.
  - 2) Install contraction joints vertical, 1/8-inch wide or 1/4 slab thickness if the slab is greater than 8-inches thick. Match joint location in adjacent Portland-cement concrete roadway pavement.
  - 3) Provide 1/2-inch radius edges. Apply a broom finish. Apply a curing agent.
- C. Protection and repair. Protect concrete from deicing chemicals during cure. Repair construction that does not drain. If necessary, fill flow-line with water to verify.



**PLAN**



**SECTION A-A**




Cottonwood Heights  
Project 004.21 - SCH A.  
Racquet Club Drive Area

Cottonwood Heights  
2277 E Bengal Boulevard  
Cottonwood Heights, UT 84121  
801-944-7000

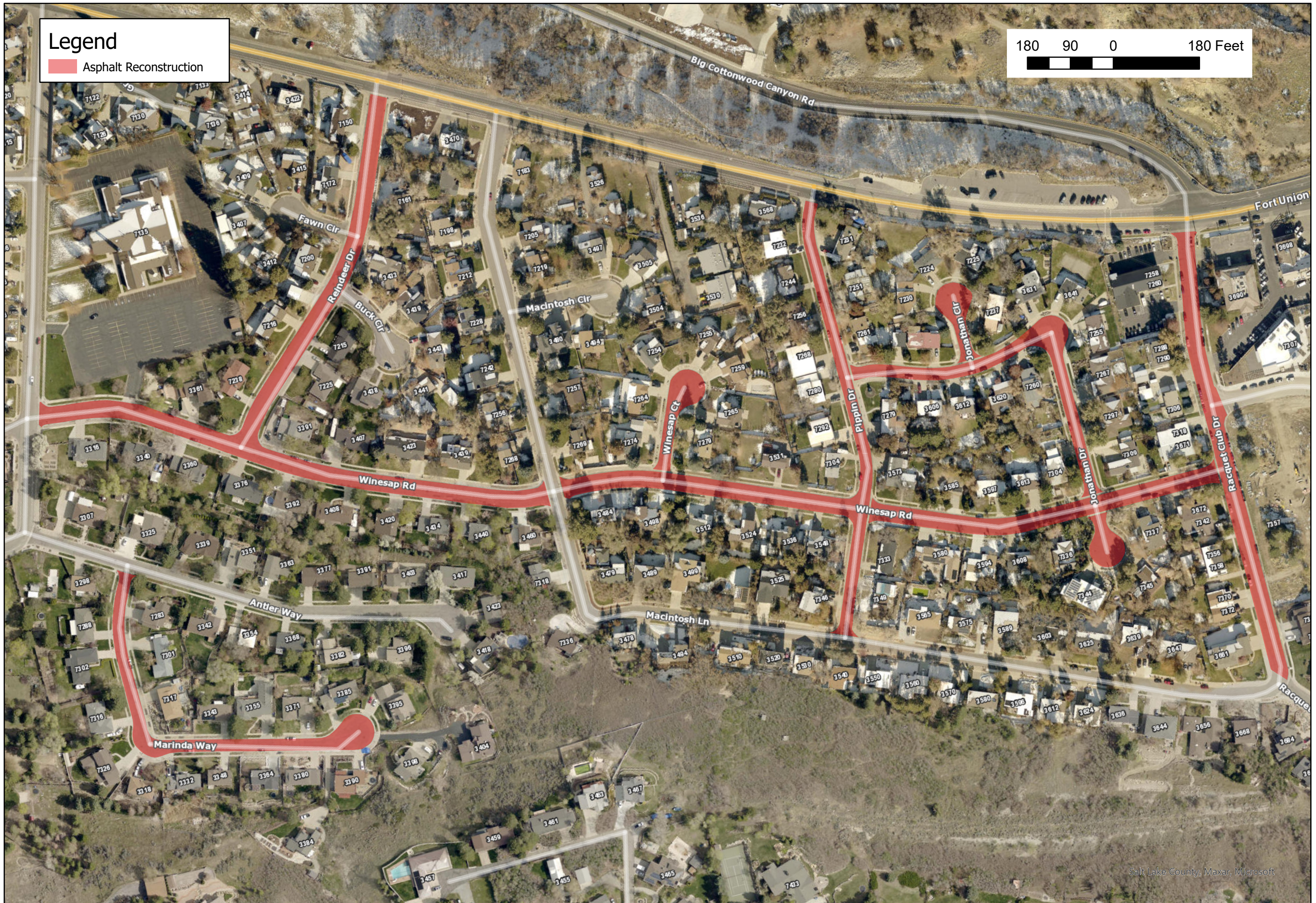
Published: June 2nd, 2021  
Sources: Utah State AGRC  
Cottonwood Heights  
Salt Lake County



Legend

 Asphalt Reconstruction

180 90 0 180 Feet







Published: June 2nd, 2021  
Sources: Utah State AGRC  
Cottonwood Heights  
Salt Lake County

Cottonwood Heights  
2277 E Bengal Boulevard  
Cottonwood Heights, UT 84121  
801-944-7000

# Cottonwood Heights Project 004.21 - SCH B. Alpen Way Area

